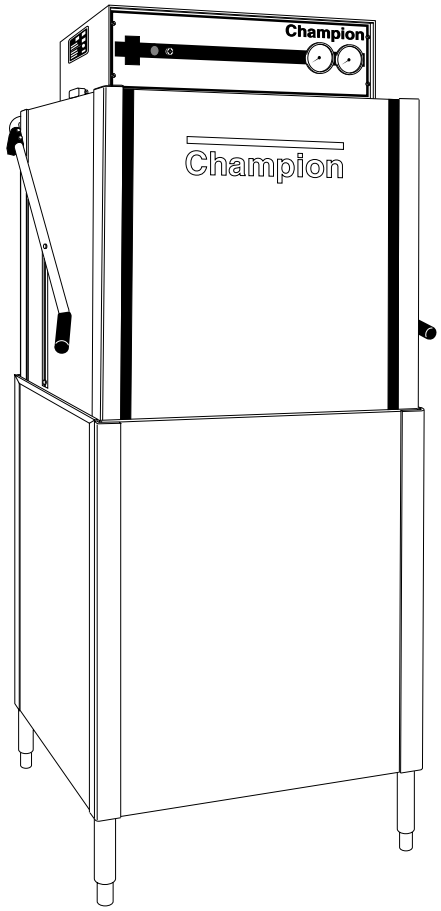
Champion®

The Dishwashing Machine Specialists

Technical Manual

For machines beginning with serial no. 90343 and above



Door-Type Dishwasher

Model

D-HBM3
High Temperature with Built-in Booster

D-H1M3
High Temperature

D-LFM3
Low Temperature

Machine Serial No.

June, 1998

Manual P/N 112428 Rev. A

P.O. Box 4149
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2674 N. Service Road
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Champion Industries, Inc.

Complete the information below so it will be available for quick reference.

Model Number_____ Serial Number _____

Voltage and Phase _____

Champion Parts Distributor _____ Phone _____

_____

Champion Service Agency_____ Phone _____

_____

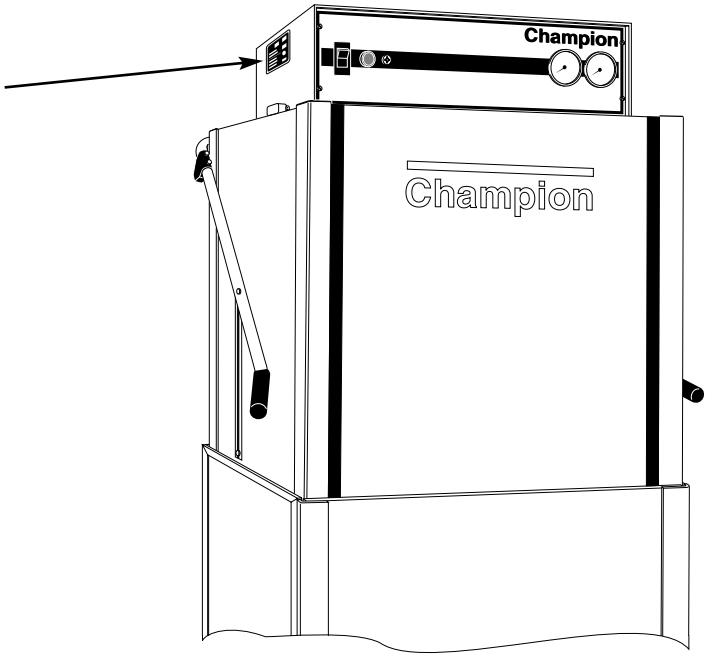
Champion Industries Service: 1 (800) 858-4477 Champion Service Fax: 1 (336) 661-1660

In Canada:
Champion Service: 1 (800) 263-5798
Canada Service Fax: 1 (905) 562-4618

We strongly recommend that you fax your orders.

NOTE: When calling to order parts, be sure to have the model number, serial number, voltage, and phase of your machine.

<u>Machine Data Plate</u> with Model & Serial number located on left side of control cabinet.



Revision History

Revision Date	Revised Pages	Serial Number Effectivity	Comments
10/6/97	All	90343	Issue manual with replacement parts lists
4/23/98	43	91586	Redesigned overflow lift arm P/N 112469 order P/N's 112469-S and 322218 for machines built prior to S/N 91586

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LIMITED WARRANTY

Champion Industries Inc. (herein referred to as Champion), P.O. Box 4149, Winston-Salem, North Carolina 27115, and P.O. Box 301, 2674 North Service Road, Jordan Station, Ontario, Canada, L0R 1S0, warrants machines, and parts, as set out below.

Warranty of Machines: Champion warrants all new machines of its manufacture bearing the name "Champion" and installed within the United States and Canada to be free from defects in material and workmanship for a period of one (1) year after the date of installation or fifteen (15) months after the date of shipment by Champion, whichever occurs first. [See below for special provisions relating to glasswashers.] The warranty registration card must be returned to Champion within ten (10) days after installation. If warranty card is not returned to Champion within such period, the warranty will expire after one year from the date of shipment.

Champion will not assume any responsibility for extra costs for installation in any area where there are jurisdictional problems with local trades or unions.

If a defect in workmanship or material is found to exist within the warranty period, Champion, at its election, will either repair or replace the defective machine or accept return of the machine for full credit; provided, however, as to glasswashers, Champion's obligation with respect to labor associated with any repairs shall end (a) 120 days after shipment, or (b) 90 days after installation, whichever occurs first. In the event that Champion elects to repair, the labor and work to be performed in connection with the warranty shall be done during regular working hours by a Champion authorized service technician. Defective parts become the property of Champion. Use of replacement parts not authorized by Champion will relieve Champion of all further liability in connection with its warranty. In no event will Champion's warranty obligation exceed Champion's charge for the machine. The following are not covered by Champion's warranty:

a. Lighting of gas pilots or burners.
b. Cleaning of gas lines.
c. Replacement of fuses or resetting of overload breakers.
d. Adjustment of thermostats.
e. Adjustment of clutches.
f. Opening or closing of utility supply valves or switching of electrical supply current.
g. Cleaning of valves, strainers, screens, nozzles, or spray pipes.
h. Performance of regular maintenance and cleaning as outlined in operator's guide.
i. Damages resulting from water conditions, accidents, alterations, improper use, abuse, tampering, improper installation, or failure to follow maintenance and operation procedures.
j. Wear on Pulper cutter blocks, pulse vanes, and auger brush.

Examples of the defects not covered by warranty include, but are not limited to: (1) Damage to the exterior or interior finish as a result of the above. (2) Use with utility service other than that designated on the rating plate. (3) Improper connection to utility service. (4) Inadequate or excessive water pressure. (5) Corrosion from chemicals dispensed in excess of recommended concentrations. (6) Failure of electrical components due to connection of chemical dispensing equipment installed by others. (7) Leaks or damage resulting from such leaks caused by the installer, including those at machine table connections or by connection of chemical dispensing equipment installed by others. (8) Failure to comply with local building codes. (9) Damage caused by labor dispute.

Warranty of Parts: Champion warrants all new machine parts produced or authorized by Champion to be free from defects in material and workmanship for a period of 90 days from date of invoice. If any defect in material and workmanship is found to exist within the warranty period Champion will replace the defective part without charge.

DISCLAIMER OF WARRANTIES AND LIMITATIONS OF LIABILITY. CHAMPION'S WARRANTY IS ONLY TO THE EXTENT REFLECTED ABOVE. CHAMPION MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED, TO ANY WARRANTY OF MERCHANTABILITY, OR FITNESS OF PURPOSE. CHAMPION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. THE REMEDIES SET OUT ABOVE ARE THE EXCLUSIVE REMEDIES FOR ANY DEFECTS FOUND TO EXIST IN CHAMPION DISHWASHING MACHINES AND CHAMPION PARTS, AND ALL OTHER REMEDIES ARE EXCLUDED, INCLUDING ANY LIABILITY FOR INCIDENTALS OR CONSEQUENTIAL DAMAGES.

Champion does not authorize any other person, including persons who deal in Champion dishwashing machines to change this warranty or create any other obligation in connection with Champion Dishwashing Machines.

INTRODUCTION

Welcome to **Champion . . .**
and thank you for allowing us to take care of your dishwashing needs.

This manual covers the door-type series dishwasher models D-H1, D-HB, and D-LF.
Your machine was completely assembled, inspected, and thoroughly tested at our factory before it was shipped to your installation site.

This manual contains:

- Warranty Information
- Operation and Cleaning Instructions
- Maintenance Instructions
- Troubleshooting Guide
- Basic Service Information
- Replacement Parts Lists
- Electrical Schematics

Complete and return your warranty registration card within ten (10) days after the installation of your machine.

All information, illustrations and specifications contained in this manual are based upon the latest product information available at the time of publication. **Champion** constantly improves its products and reserves the right to make changes at any time or to change specifications or design without notice and without incurring obligation.

For your protection, factory authorized parts should always be used for repairs.

Replacement parts may be ordered from your **Champion** authorized parts distributor or from your **Champion** authorized service agency. When ordering parts, please supply the model number, serial number, voltage and phase of your machine, the part number, part description and quantity.

GENERAL

This manual covers the Champion door type dishwashing machine. These machines are fully automatic and come equipped with a 1-HP pump motor.

The D-series dishwasher is available in the following models:

Model Numbers

D-H1, D-HB, D-LF

The D-H1 model is a high temperature (180°F/82°C rinse) sanitizing model without booster.

The D-HB model is a high temperature (180°F/82°C rinse) sanitizing model with booster.

The D-LF is a low temperature (Min. 120°F/49°C-140°F/60°C Optimum) sanitizing model for use with a sodium hypochlorite (Chlorine) based sanitizer at a minimum concentration of 50PPM in the final rinse.

Standard Equipment includes:

D-H1, D-HB, D-LF

- Automatic tank fill
- Built-in electric (D-HB only) or steam booster heater (D-HB only)
- Door activated drain
- Field convertible to corner model
- Electric tank heat
- Balanced three door lift system
- Low-water tank heat protection
- 1-hp drip-proof pump motor
- Door safety switches
- Common utility connections
- Two dish racks (peg and flat bottom)
- Detergent/chemical connection provisions
- Stainless steel front and side panels
- Top-mounted, splash-proof control console
- 60-second time cycle
- 1-1/2" O.D. gravity drain connection
- Water pressure regulating valve (mounted) (D-HB only)
- Interchangeable upper and lower spray arms

Options (D-HB only)

- Electric booster (70°F/39°C temperature rise) heater for 110°F/43°C supply water
- Steam injector or steam coil tank heat (steam booster 40°F/23°C – 70°F/39°C rise)
- Single source gas booster system

Accessories

Additional dishracks:	
Dish rack (peg)	P/N 101285
Silverware rack (flat bottom)	P/N 101273
3/4” Pressure reducing valve (PRV)	P/N 112387

Electrical Power Requirements for Electric Heat / Electric Booster

Model	Voltage	Booster Rise (D-HB Only)	Machine Full Load Amps	Power Requirement (125% Service Factor)
D-H1/LF	115/60/1	—	48 Amps	60 Amps
D-H1/LF	208/60/1	—	23 Amps	29 Amps
D-H1/LF	220/60/1	—	23 Amps	29 Amps
D-H1/LF	230/60/1	—	23 Amps	29 Amps
D-H1/LF	240/60/1	—	24 Amps	30 Amps
D-H1/LF	208/60/3	—	12 Amps	15 Amps
D-H1/LF	220/60/3	—	13 Amps	16 Amps
D-H1/LF	230/60/3	—	13 Amps	16 Amps
D-H1/LF	240/60/3	—	13 Amps	16 Amps
D-H1/LF	380/60/3	—	7 Amps	9 Amps
D-H1/LF	415/60/3	—	8 Amps	10 Amps
D-H1/LF	480/60/3	—	6 Amps	8 Amps
D-H1/LF	575/60/3	—	5 Amps	6 Amps
D-HB	115/60/1	—	—	—
D-HB	208/60/1	40°F/23°C	59 Amps	74 Amps
D-HB	220/60/1	40°F/23°C	61 Amps	76 Amps
D-HB	230/60/1	40°F/23°C	63 Amps	79 Amps
D-HB	240/60/1	40°F/23°C	65 Amps	81 Amps
D-HB	208/60/3	40°F/23°C	33 Amps	41 Amps
D-HB	220/60/3	40°F/23°C	35 Amps	44 Amps
D-HB	230/60/3	40°F/23°C	36 Amps	45 Amps
D-HB	240/60/3	40°F/23°C	37 Amps	46 Amps
D-HB	380/60/3	40°F/23°C	20 Amps	25 Amps
D-HB	415/60/3	40°F/23°C	20 Amps	25 Amps
D-HB	480/60/3	40°F/23°C	17 Amps	21 Amps
D-HB	575/60/3	40°F/23°C	14 Amps	18 Amps
D-HB	115/60/1	—	—	—
D-HB	208/60/1	—	—	—
D-HB	220/60/1	—	—	—
D-HB	230/60/1	—	—	—
D-HB	240/60/1	—	—	—
D-HB	208/60/3	70°F/39°C	50 Amps	63 Amps
D-HB	220/60/3	70°F/39°C	52 Amps	65 Amps
D-HB	230/60/3	70°F/39°C	54 Amps	68 Amps
D-HB	240/60/3	70°F/39°C	56 Amps	70 Amps
D-HB	380/60/3	70°F/39°C	30 Amps	38 Amps
D-HB	415/60/3	70°F/39°C	33 Amps	41 Amps
D-HB	480/60/3	70°F/39°C	28 Amps	35 Amps
D-HB	575/60/3	70°F/39°C	23 Amps	29 Amps

INSTALLATION

Unpacking

CAUTION:
Care should be taken when lifting the machine to prevent damage.

1. Immediately after unpacking the machine, inspect for any shipping damage. If damage is found, save the packing material and contact the carrier immediately.
2. Remove the dishwasher from the skid. Adjust the feet if required, then move the machine to its permanent location.
3. Level the machine (if required) by placing a level on the top of machine and adjusting the feet. Level the machine front-to-back and side-to-side.
4. Remove the two dishracks and pressure gauge from the interior of the machine. Install the pressure gauge in the upper fill piping of the dishwasher in the petcock provided.

NOTE:
The installation of your machine must meet local health codes.

Changing from Straight-through to Corner Operation

Your door-type dishwasher is shipped from the factory in a straight-through configuration. The following instructions explain how to convert your machine for corner operation.

Refer to Fig. 1 below.

1. Place the dishwasher so the operator controls are readily accessible.
2. Minimum clearance from any corner wall is 5-1/4" (133mm).

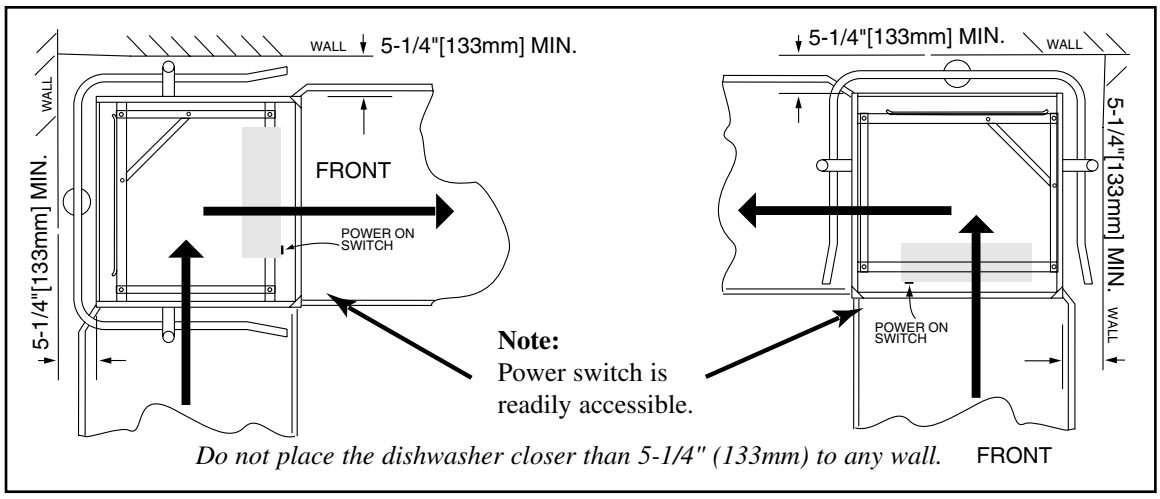


Figure 1
Placement for Corner Operation

Changing from Straight-through to Corner Operation (cont'd)

Refer to Fig. 2 and perform the steps below.

1. Remove the front rack guide (A). Discard the square spacers.
2. Move front rack guide (A) to the left side of the rack tracks. (See Fig. 2b) Use existing hardware.
3. Unbolt the track (B) and rack support rod (C).
4. Remove and save the two remaining fasteners from rear track.
5. Bolt (B) and (C) as shown in Fig. 2b.

Figure 2
Changing the Track Assembly

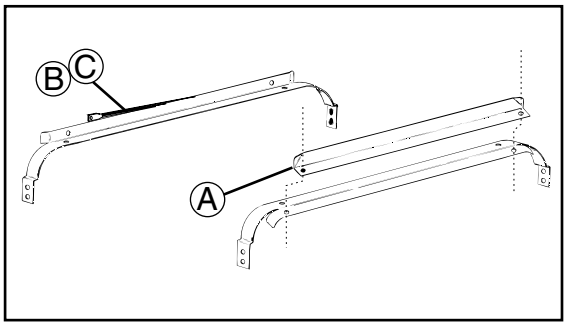


Figure 2a
Straight-Through Configuration

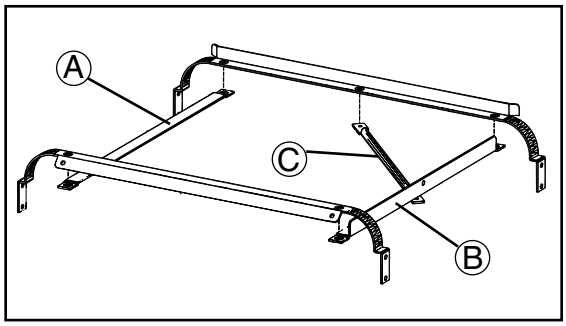


Figure 2b
Corner Configuration

Electrical Connections

WARNING:
Electrical and grounding connections must comply with the National Electrical Code and/or Local Electrical Codes.

WARNING:
When working on the dishwasher, disconnect the electric service and place a tag at the disconnect switch to indicate work is being done on that circuit.

1. A qualified electrician must compare the electrical power supply with the machine electrical specifications stamped on the MACHINE ELECTRICAL CONNECTION PLATE located inside the top mounted control cabinet before connecting to the incoming service at a fused disconnect switch.
2. Motor rotation was set at the factory. Check the rotation of the motor shaft (CW when viewed from rear of motor). For three phase machines, reversing the motor direction is done in the control cabinet by reversing the wires L1 and L2 on the disconnect side of the main electrical connection block. For single phase machines, motor rotation is changed at the motor connection plate on the rear of the single phase motor.

Electrical Connections (cont'd)

3. A knock-out is provided at the rear of the top mounted control cabinet for the electrical service connection. A single source electrical connection has been provided. A fused disconnect switch or circuit breaker (supplied by others) is required to protect each power supply circuit.

Plumbing Connections

CAUTION:
Plumbing connections must comply with local sanitary and plumbing codes.

Water Connections

1. Connect the hot water supply using a 3/4" NPT connection. The connection point is located behind the lower front panel of the dishwasher. Supply enters from underneath the machine.

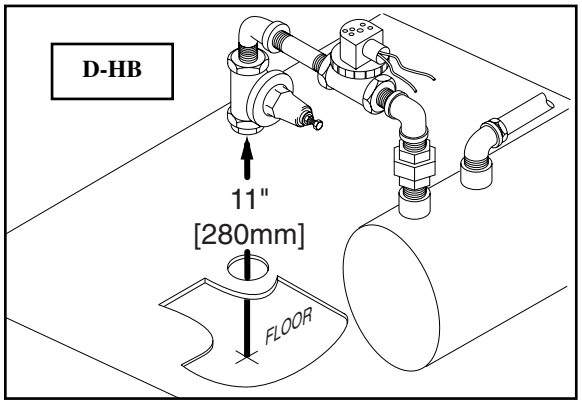


Figure 3
D-HB
3/4" NPT Water Supply Connection
Behind Front Panel

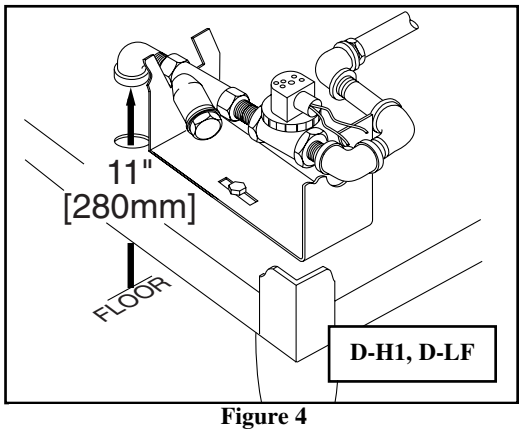


Figure 4
D-H1, D-LF
3/4" NPT Water Supply Connection
Behind Front Panel

2. Minimum incoming water supply temperature requirements are listed below:

   D-HB with built-in 40°F/23°C rise electric booster (Minimum 140°F/60°C)
   (Min./Max. flow pressure 20-22 psi/138 Kpa)

   D-HB with built-in 70°F/39°C rise electric booster (Minimum 110°F/43°C)
   (Min./Max. flow pressure 20-22 psi/138 Kpa)

   D-H1 without built-in booster (Minimum 180°F/70°C)
   (Min./Max. flow pressure 20-22 psi/138 Kpa)

   D-LF (Minimum 120°F/49°C - 140°F/60°C Optimum)
   (Min./Max. flow pressure 20-22 psi/138 Kpa)

3. A manual shut-off valve for steam and water (supplied by others) should be installed in supply line to allow for servicing of the machine. The shut-off valve should be the same size or larger than the supply line.

Water Connections (cont'd)

4. A 3/4" Pressure Regulating Valve (PRV), should be installed on the incoming water supply line if water flow pressure exceeds 20-22 psi/138 Kpa.
   A PRV is standard equipment on Model D-HB.
   A PRV is not standard equipment on Models D-H1 and D-LF.
   The PRV may be obtained locally or direct from Champion.

Drain Connections

Refer to Fig. 5 for the location of the machine drain.

1. Models D-HB, D-H1, and D-LF are GRAVITY DRAIN machines equipped with a 1-1/2" hose connection point.
   • Drain height for ALL MODELS must not exceed 11" [280mm] above floor level.

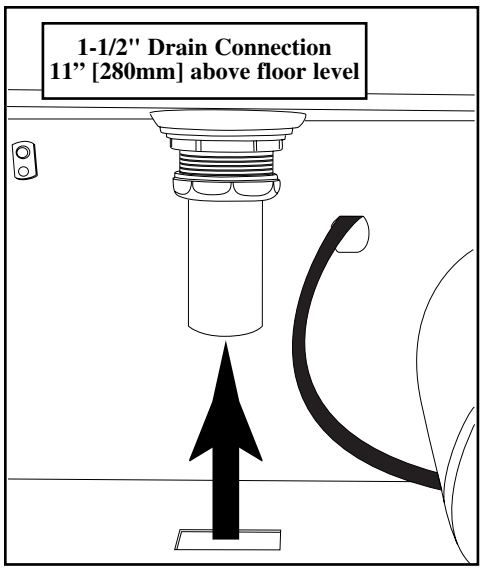


Figure 5
D-HB, D-H1, D-LF
1-1/2" Drain Connection
Lower Center of Machine

WARNING:
Connection of the machine to a drain line higher than the machine drain height will prevent the machine from draining properly.

Ventilation

NOTE:
Ventilation must comply with local sanitary and plumbing codes.

CAUTION:
Exhaust air should not be vented into a wall, ceiling, or concealed space of a building. Condensation can cause damage.

Chemical Connections

NOTE:
Consult a qualified chemical supplier for your chemical needs.

Models D-HB, D-H1 and D-LF

1. Refer to Fig. 6
   Labeled chemical signal connection points are provided inside the control cabinet for chemical dispensing equipment (supplied by others).

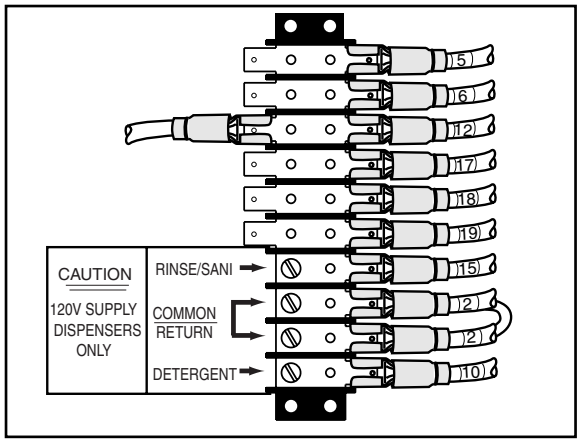


Figure 6
D-HB, D-H1, D-LF
Chemical Connection Points
Left Side Interior of Control Cabinet

Signal connection points include:

- Detergent signal 120VAC between Wire #10 and Wire #2 **(1 AMP MAX AMP LOAD)**
- Rinse Aid/Sanitizer signal 120VAC between Wire #15 and Wire #2 **(1 AMP MAX AMP LOAD)**

Detergent

1. Refer to Fig. 7
   Two removable black plugs, located on the rear and left side of the wash tank are provided as detergent equipment insertion points.

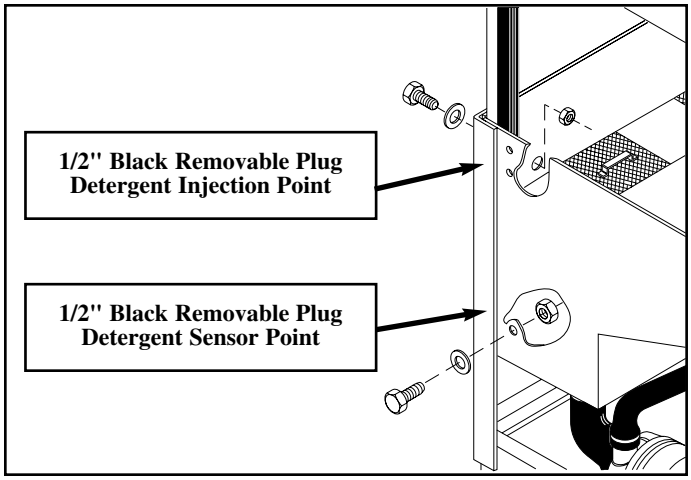


Figure 7
D-HB, D-H1, D-LF
Wash Tank Detergent Equipment
Insertion Points

Chemical Connections (cont'd)

Detergent (cont'd)

2. Detergent may be added manually if dishwasher is not equipped with dispensing equipment. Consult your chemical supplier for recommended amounts.

Rinse Aid/Sanitizer

Model D-HB and D-H1

Refer to Fig. 8

1. A rinse aid injection point is provided via a 1/4" NPT plug located in the final rinse piping. The plug is located in a cross fitting on the outlet side of the vacuum breaker. The vacuum breaker is located behind the control cabinet at the top of the machine.
2. Use a liquid rinse aid.

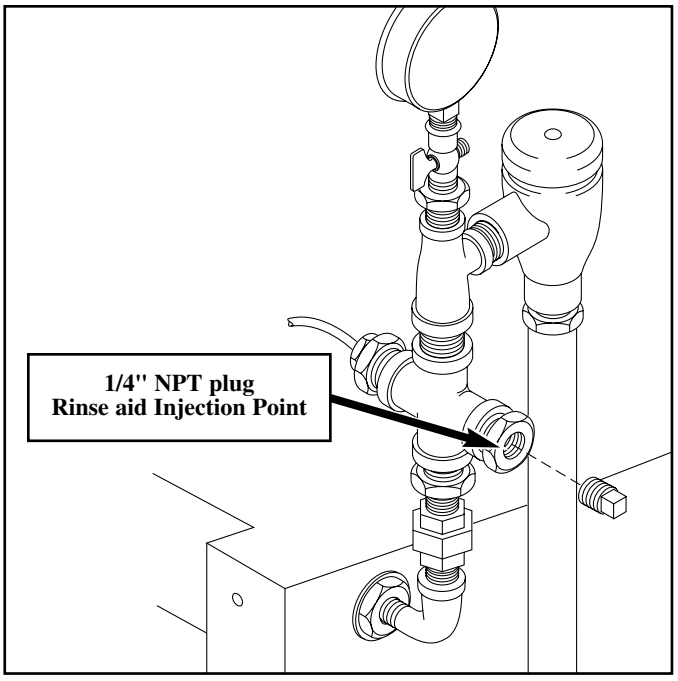


Figure 8
Rinse aid Insertion Point
D-HB, D-H1 Only

NOTE:
Models D-HB and D-H1 do not require sanitizer.

Chemical Connections (cont'd)

Rinse Aid/Sanitizer (cont'd)

Model D-LF

Refer to Fig. 9

1. A rinse aid injection point is provided via a 1/4" NPT plug located in the final rinse piping. The plug is located in a cross fitting on the outlet side of the vacuum breaker. The vacuum breaker is located behind the control cabinet at the top of the machine.
2. Use a liquid rinse aid.
3. A sanitizer injection point is provided via a 1/8" NPT plug located in the final rinse piping. The plug is located in a cross fitting on the outlet side of the vacuum breaker. The vacuum breaker is located behind the control cabinet at the top of the machine.
4. Use a sodium hypochlorite (Chlorine) based sanitizer at a minimum concentration of 50PPM in the final rinse.
   Use chlorine test papers to verify and monitor the 50PPM chlorine level.

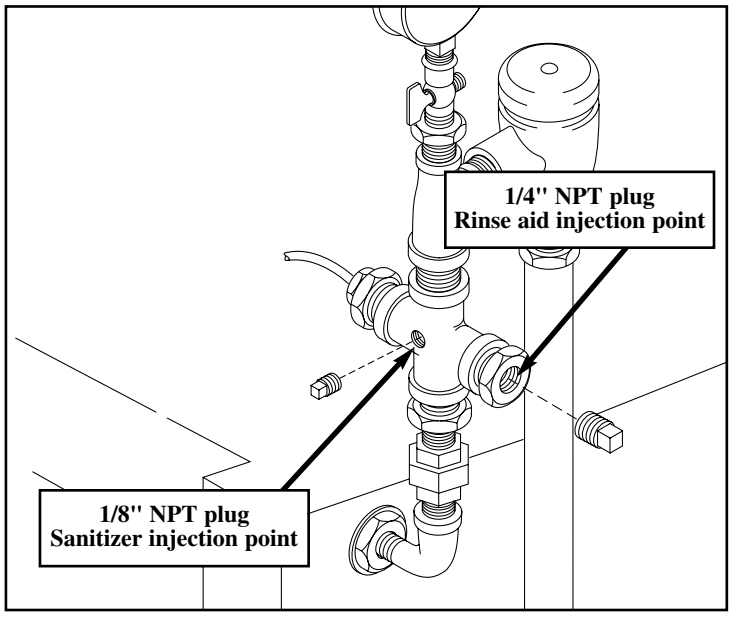


Figure 9
D-LF
Rinse Aid/Sanitizer Injection Points

WARNING:
Never premix rinse aid with the sanitizing agent. Mixing may cause hazardous gases to form.

CAUTION:
Some metal, including silver, aluminum, and pewter are attacked by sodium hypochlorite (chlorine sanitizer). Avoid cleaning these metals in a D-LF dishwasher.

INITIAL START-UP

After plumbing and electrical connections are completed, follow the steps below to place your machine in service.

Model D-HB, D-H1 and D-LF

Refer to Figs. 10 and 11 below.

1. Remove any foreign material from inside the machine. Make sure scrap screens are in place.
2. Make sure drain lever assembly is closed.
3. Close the Door.
4. Turn the water and main power sources to the dishwasher ON.
5. Flip the Power switch to the ON position. The “power on” light will illuminate and the machine will automatically fill with water.
6. Check the machine for leaks.
7. Push the Green Start Button to check automatic cycle.
8. Check pump motor rotation. Rotation is CW when viewed from rear of motor.
9. If machine checks okay, lift the drain lever assembly to drain machine.
10. Flip the power switch to OFF.

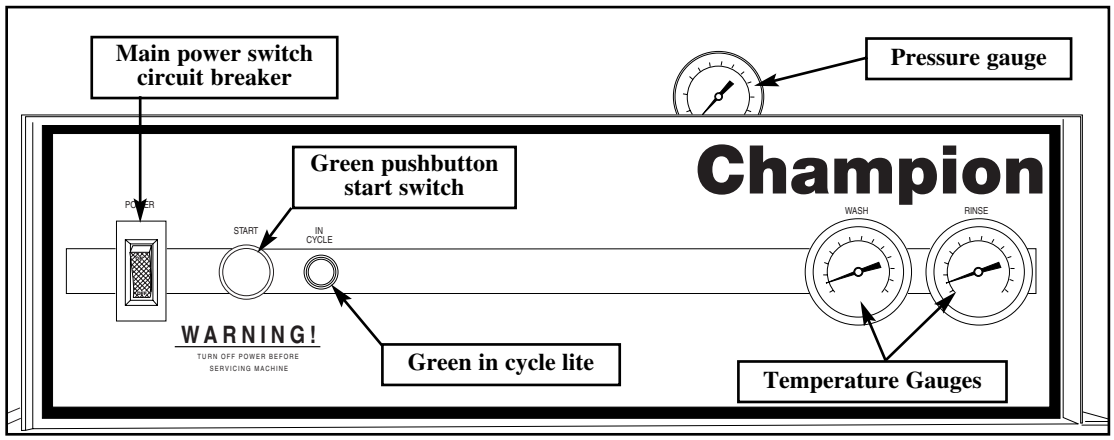


Figure 10
Operator Controls
Top Mounted Control Cabinet

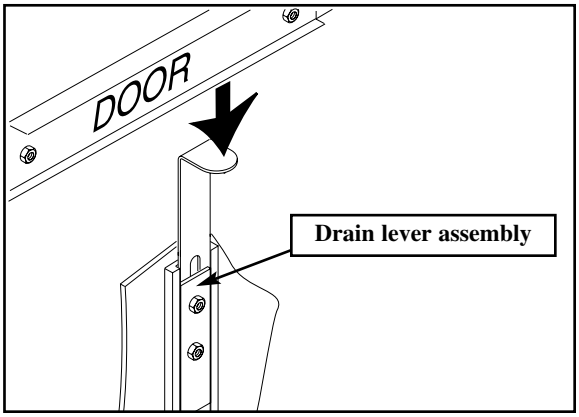


Figure 11
Door Activated
Drain Lever Assembly

OPERATION

Model D-HB, D-H1 and D-LF

1.	Close the door and flip power switch ON	Power light illuminates. Tank fills automatically and tank heat comes on.
2.	Monitor wash tank temperature gauge	Wait for temperature reading to reach Min. 150°F/66°C (D-HB, D-H1 Only) Temperature reading must be Min. 120°F-140°F/49°C-60°C Optimum (For D-LF Only)
3.	Prescrap and load ware into rack	Place dishes edgewise in peg rack, cups and bowls upside down in flat rack, and silverware spread evenly in single layer in flat rack.
4.	Open door, insert rack	
5.	Close door, Push Green start button	Green cycle light will illuminate. Automatic cycle begins. Machine washes for 45 sec., then pauses for 1 sec.
6.	During Final Rinse monitor pressure gauge and final rinse temperature gauge	Machine final rinses for 14 sec. Pressure gauge reading must read between 20-22 PSI. Temperature gauge must read 180-195°F/82-91°C (D-HB, D-H1 Only) Min. 120°-140°F/49°C-60°C Optimum (D-LF Only)
7.	60-second cycle complete	Green cycle light goes out.
8.	Open door, remove clean rack	Insert another rack of soiled ware.
9.	After each meal period or every two hours operation	Lift drain lever assembly to drain machine. Flush interior and clean scrap screens and pump intake strainer. Check spray arms and clean if necessary.

NOTE:
Opening the door at any time during the cycle will stop the machine.
Closing the door and pushing the Green start button will resume the cycle where it left off.

MAINTENANCE

Cleaning your machine is the best maintenance that you can provide. Components that are not regularly flushed and cleaned do not perform well.

The Maintenance intervals shown in the following schedules are the minimum requirements necessary for the proper performance of your machine. Maintenance intervals should be shortened whenever your machine is faced with abnormal working conditions, hard water, or multiple shift operations.

Maintenance Schedule

CLEANING

• Every 2 Hours or After Each Meal Period

Model D-HB, D-H1, and D-LF

1. Flip the power switch OFF.
2. Lift drain lever, drain the machine.
3. Flush tank interior with fresh water.
4. Remove and clean the scrap screens. Clean the pump intake screen.
5. Inspect the spray arm nozzles and rinse nozzles. Clean if necessary.
6. Close door, flip power switch ON to refill machine.

• Every 8 Hours or at the End of the Day

Model D-HB, D-H1, and D-LF

1. Flip the power switch OFF.
2. Lift drain lever, drain the machine.
3. Flush tank interior with fresh water.
4. Remove and clean the scrap screens. Clean the pump intake screen.
5. Remove the spray arms.
6. Clean and inspect the spray arm bearings.
7. Flush the wash arm and rinse arm assemblies and nozzles.
8. Back flush the scrap screens and pump intake strainer.
9. Thoroughly clean the exterior of the machine. DO NOT HOSE DOWN WITH WATER.
10. Reassemble the machine. Leave the door open to aid overnight drying.

CAUTION:
DO NOT LEAVE WATER IN WASH TANK OVERNIGHT

DELIMING

Your dishwasher should be delimed regularly depending on the mineral content of your water. Inspect the machine interior for mineral deposits and use a deliming solution for the best cleaning results.

NOTE:
Consult your chemical supplier for an appropriate deliming solution.

WARNING:
Deliming solutions or other acids must not come in contact with household bleach (sodium hypochlorite) or any chemicals containing chlorine, iodine, bromine, or fluorine. Mixing will cause hazardous gases to form.
Skin contact with deliming solutions can cause severe irritation and possible chemical burns. Consult your chemical supplier for specific safety precautions.

DELIMING PROCESS

Model D-HB, D-H1, and D-LF

1. Remove all dishes from machine.
2. Remove any chemical pick-up tubes from their containers.
3. Place each tube in a container of fresh water and prime the chemical lines for several minutes to thoroughly flush chemical from the lines. Leave pick-up tubes out of their containers.
4. Drain the machine and refill with fresh water.
5. Spray interior walls with delimimg solution and let sit for 5 or 10 minutes depending on amount of build-up. Add deliming solution to wash tank. Do not let chemicals sit for longer than 15 minutes.
6. Push the Green start button and run an automatic cycle.
7. Repeat Steps 3-4 if necessary.
8. Lift the drain lever assembly and drain the machine.
9. Refill the machine and run a complete cycle two additional times. Drain and refill the machine after each cycle to thoroughly flush any deliming solution from the interior of the machine.
10. Flip the power switch to OFF.
11. Drain machine.
12. Deliming is complete.

OPERATION CHECKS

• Daily

1. Check temperature gauges for proper readings.
2. Check pressure gauge for proper reading (D-H1, D-HB ONLY).
3. Check for leaks.
4. Check chemical supplies and refill as necessary.

• Weekly

1. Inspect all water lines for leaks.
2. Clean all detergent residue from the exterior of the machine.
3. Check the drains for leaks.
4. Clean accumulated mineral deposits from the tank heating elements
5. Check that float switch moves freely.

TROUBLESHOOTING

Before determining any specific cause of a breakdown or abnormal operation on your dishwasher, check that:

Checklist

1. Main power and water supply are turned on to the machine
2. All switches are ON
3. Drain and overflow tube are in place and seated
4. Wash pipe and rinse nozzles are clean
5. Scrap screen(s) are properly positioned
6. Spray pipes are in their proper positions
7. Doors are fully closed
8. Thermostat(s) are at their correct setting
9. Sanitizer, detergent, and rinse additive dispensers are adequately filled.

If a problem still exists, use the following for troubleshooting.

CONDITION	CAUSE	SOLUTION
Machine will not start	Door not closed	Make sure doors are fully closed
	Door safety switch faulty	Contact your service agency
	Start switch faulty	Contact your service agency
	Main switch OFF	Check disconnect
	Overload protector tripped	Reset overload in Control Box
Low or no water	Main water supply is turned off	Turn on house water supply
	Drain/overflow tube is not in place and seated	Place and seat drain tube
	Defective drain/overflow O'ring	Replace O'ring
	Machine doors not fully closed	Close doors securely
	Faulty fill valve	Contact your service agency
	Defective fill timer	Replace fill timer
	Stuck or defective float	Check floats and clean
	Clogged "Y" strainer	Clean or replace
Continuous water filling	Stuck or defective float	Check floats and clean
	Defective drain/overflow O'ring	Replace O'ring
	Fill valve will not close	Clean or replace
	Defective fill timer	Replace fill timer
	Drain tube not in place	Look for drain tube in tank

CONDITION	CAUSE	SOLUTION
Any motor not running	Overload protector tripped	Reset overload in Control Box
	Defective motor	Contact your service agency
Wash tank water temperature is low when in use	Incoming water temperature at machine too low	Raise temperature to: 140°F/60°C for D-HB and D-LF, 180°F/82°C for D-H1
	Defective thermometer	Check or replace
	Defective thermostat	Check for proper setting or replace
	Lime scale buildup on heating elements	Delime element
	Defective heater element	Check or replace
	Low steam pressure	Check steam supply pressure (15-30 psi)
	Defective steam trap	Check or replace
	Defective solenoid valve	Check or replace
Insufficient pumped spray pressure	Clogged pump intake screen	Clean
	Clogged spray pipe	Clean
	Scrap screen full	Must be kept clean and in place
	Low water level in tank	Check drain and overflow tube
	Pump motor rotation incorrect	Reverse connection between L1 and L2 in Control Cabinet (3PH machines only)
	Defective pump seal	Contact Service Agent
Insufficient final rinse or no final rinse	Faulty pressure reducing valve	Clean or replace
	Improper setting on pressure reducing valve	Set psi flow pressure at 20-22 psi/138 Kpa
	Clogged rinse nozzle and/or pipe	Clean
	Improper water line size	Have installer change to proper size (3/4" min.)
	Clogged “Y” strainer	Clean or replace
Low final rinse temperature	Low incoming water temperature	Check house supply water temperature
	Improper setting of booster thermostat	Be sure booster thermostat is set to maintain 180°F/82°C temperature
	Defective booster thermostat	Replace thermostat
	Defective thermometer	Check for proper setting or replace
Poor washing results	Detergent dispenser not operating properly	Contact detergent supplier
	Insufficient detergents	Contact detergent supplier
	Wash water temperature too low	See condition “Wash Tank Water Temperature” above
	Wash arm clogged	Clean
	Improperly scraped dishes	Check scraping procedures
	Ware being improperly placed in rack	Use proper racks. Do not overload racks
	Improperly cleaned equipment	Unclog wash sprays and rinse nozzles to maintain proper pressure and flow conditions. Overflows must be open. Keep wash water as clean as possible.
	Electric Elements or steam coils has soil/lime buildup	Clean and/or delime
Poor drying results	Insufficient rinse-aid	Contact chemical supplier
	Low final rinse temp	See condition “Low final rinse temperature.”

BASIC SERVICE

This Basic Service section does not cover all possible repair procedures. If you require additional service support, you may call your local service company or:

Champion National Service
1-800-858-4477

In Canada
1-800-263-5798

Please have the Model and Serial Number of the machine ready when you call.

ELECTRICAL SERVICE

WARNING:
Disconnect Power at main disconnect switch before removing lower panels. Removing lower panels exposes live open electrical wiring (not contained in conduit).

Always replace panels after completing service or repairs. Do not operate the dishwasher with panels removed for anything other than service repair operation.

NOTE:
DO NOT USE CHASSIS GROUND WHEN PERFORMING VOLTAGE CHECKS.
Doing so will result in false and inaccurate readings.
PERFORM VOLTAGE CHECKS BY READING FROM THE HOT SIDE OF THE LINE AND NEUTRAL (any #2 or white wire).

WARNING:
USE EXTREME CAUTION *when performing tests on energized circuits.*

WARNING:
When repairing a circuit, disconnect the power at the main service disconnect switch and place a tag at the disconnect switch to indicate that work is being performed on the circuit.

Troubleshooting

Schematics

Champion places an electrical schematic in the control cabinet of every machine before it is shipped. Schematics are included at the back of this manual as well. Be aware that these schematics include options that may not apply to your machine. Options are enclosed in dashed lines with the words (IF USED) next to them on the schematic. Disregard any options that appear on the schematics which are not a part of your machine.

ELECTRICAL SERVICE (cont'd)

Fuses —

Refer to Fig. 12.
There are two fuse blocks, located in the center of the main control cabinet. The (A) fuses protect the main control transformer. The (B) fuses protect the wash tank heater circuit.
Fuses are marked FU on the electrical schematic.
Booster heater circuits (D-HB only) are not fused.

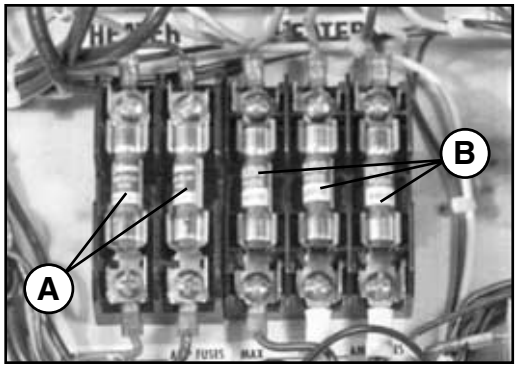


Figure 12
Fuses
(Three phase shown)

To Replace a fuse:
Turn the dishwasher main power switch off.
Disconnect power to the machine at the main service disconnect switch.
Replace the fuse. If the fuse blows again,
DO NOT INCREASE THE FUSE SIZE.
DETERMINE THE CAUSE OF THE OVERLOAD.

Motor Overloads —

The wash pump motor has an overload to protect it from line voltage electrical overloads. The overload disconnects 120VAC power to the motor contactor coil.

Refer to Fig. 13.

Note the Switch Lever on the Overload.
If the switch lever is off with the "0" showing then the overload has tripped.

To Reset the Motor Overload:
Flip the overload switch to the On position.
A "1" should be visible on the switch lever.

To Replace a Motor Overload:
Disconnect the wires to the overload.
Release the mounting catch on the front side of the overload. Push forward and lift out.
Snap the new overload into place and reconnect the wires.

To adjust the overload setting:
The screwdriver in Fig. 13 is positioned to adjust the motor overload AMP setting.
Read the full load amps (FLA) motor amps on the motor nameplate. Turn setting to match nameplate.

Figure 13
Motor Overload

ELECTRICAL SERVICE (cont'd)

Timers

D-HB, D-H1, and D-LF models have two timers located in the top mounted main control cabinet.

These timers are not adjustable.
The timer chart is shown in Fig. 15.

Cycle Timer —

Refer to Fig. 14.
The cycle timer controls the dishwasher's 60-second operation. The timer consists of a timer motor, four micro-switches, and four non-adjustable metal cams.
Cam A controls power to the timer motor
Cam B controls power to the wash motor.
Cam C controls power to the final rinse valve.
Cam D controls the dishwasher instant start.

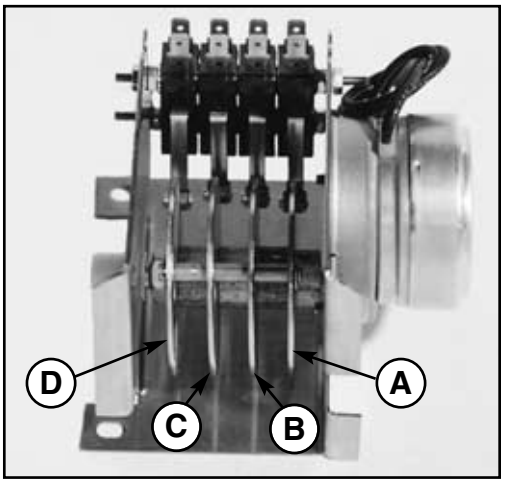


Figure 14
Cycle Timer

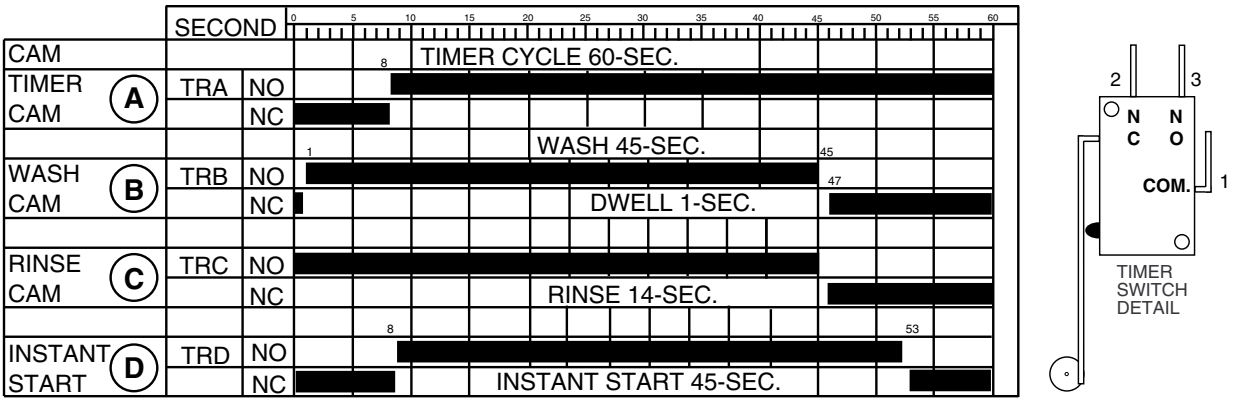


Figure 15
Cycle Timer Chart

Fill Timer —

Refer to Fig. 16.
The fill timer controls the dishwasher's 90-second fill operation. The timer consists of a timer motor, one micro-switch, and one non-adjustable plastic cam. The fill timer operates during initial fill and any time the low water tank heat protection circuit calls for make-up water. Refer to Timed Fill/Low Water Tank Heat Protection on the next page for an explanation of the fill timer operation.

Figure 16
Fill Timer

ELECTRICAL SERVICE (cont'd)

Timed Fill/Low Water Tank Heat Protection —

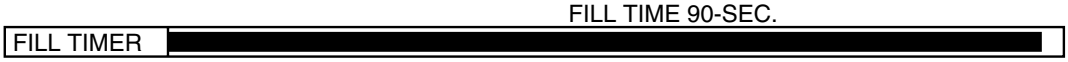


Figure 17
Fill Timer Chart

Figure 18
Float Switch

Models D-HB, D-H1, and D-LF use a float switch and fill timer to control tank fill and tank heat.

For Model D-HB only, the built-in booster heat circuit is also controlled by the float switch.

Operation:

1. When dishwasher main power switch is turned on (wash tank empty), the fill timer runs for a minimum of 90 seconds to fill the tank.
2. The float switch ball rises; its normally open contacts close. The fill circuit times out; the fill solenoid de-energizes, and the tank heat and booster heat energize.
3. If water level drops below the float level, the float switch ball moves down; heat de-energizes. The fill solenoid energizes and the fill timer runs for a minimum of 90 seconds to refill the tank.
4. If the tank is not full of water at the end of the 90-second fill timer cycle, then the fill timer will cycle again. When the float switch is satisfied, the fill timer stops after completing its 90-sec. cycle.
5. Refer to the float switch troubleshooting chart below (Fig.19) for a quick guide to evaluating float switch problems.

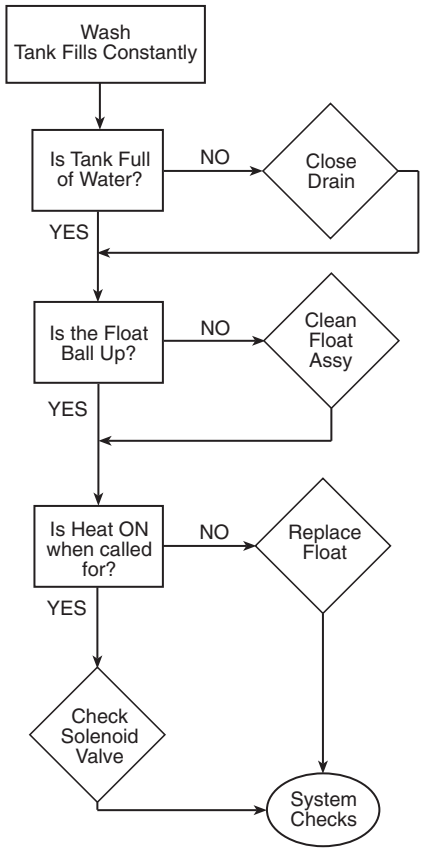


Figure 19
Float Switch
Troubleshooting Chart

ELECTRICAL SERVICE (cont'd)

Heater Element Wiring – Booster Tank and Wash Tank Heater Elements

Refer to the illustrations and follow the steps below to properly install terminal jumpers and to make line power connections to a replacement element.

Step 1. Hold the element assembly with the calrod coils facing toward you.

Step 2. Match your element coil to Configuration A, B, C, or D.

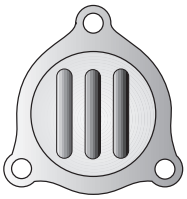
Step 3. Rotate your element coils to match the correct configuration.

Step 4. Turn the element over and match your element to the correct terminal configuration.

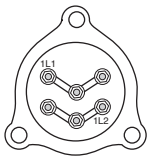
Step 5. Install terminal jumpers according to the illustration for your voltage requirement.

Step 6. Install the element and make your line connections 1L1, 1L2, or 1L3 per the illustration.

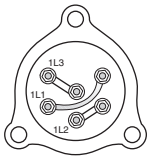
Configuration A
Booster tank element
View of calrod coils



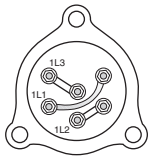
Terminal Connections view of element



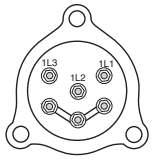
208V/1 Phase



208-240V/3 Phase
Delta Connection

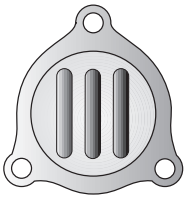


480V/3 Phase
575V/3 Phase
Delta Connection

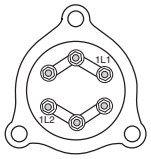


208-240V/3 Phase
Wye Connection for
380-415V/3 Phase

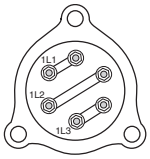
Configuration B
Booster tank element
View of calrod coils



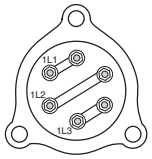
Terminal Connections view of element



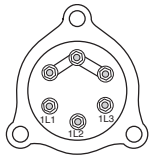
208V/1 Phase



208-240V/3 Phase
Delta Connection

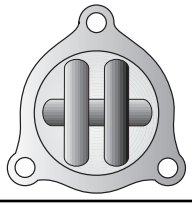


480V/3 Phase
575V/3 Phase
Delta Connection

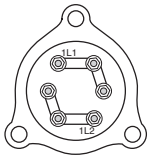


208-240V/3 Phase
Wye Connection for
380-415V/3 Phase

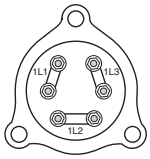
Configuration C
Booster tank element
View of calrod coils



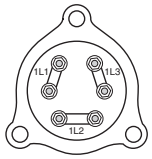
Terminal Connections view of element



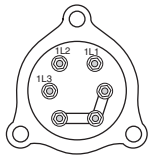
208V/1 Phase



208-240V/3 Phase
Delta Connection

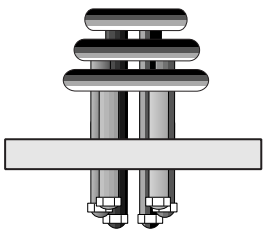


480V/3 Phase
575V/3 Phase
Delta Connection

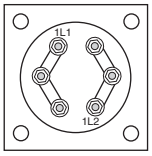


208-240V/3 Phase
Wye Connection for
380-415V/3 Phase

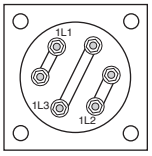
Configuration D
Wash tank element
View of calrod coils



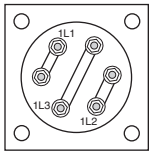
Terminal Connections view of element



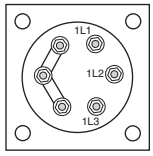
208V/1 Phase



208-240V/3 Phase
Delta Connection



480V/3 Phase
575V/3 Phase
Delta Connection



208-240V/3 Phase
Wye Connection for
380-415V/3 Phase

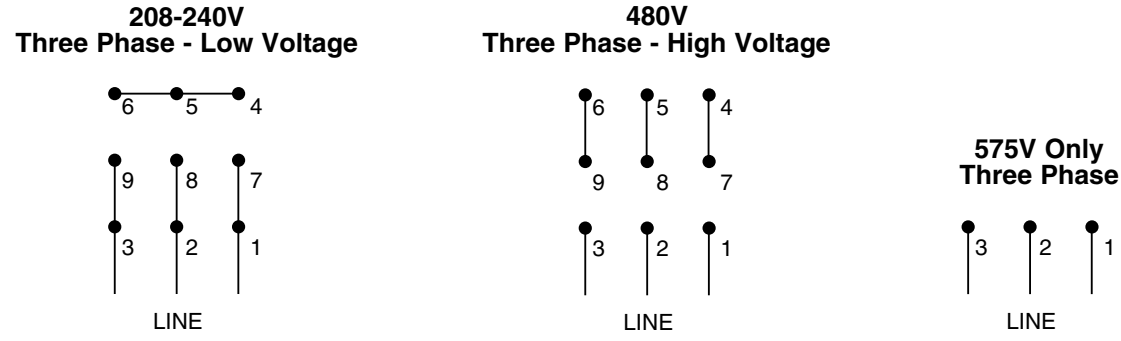
ELECTRICAL SERVICE (cont'd)

Motor Connections —

1. Models D-HB, D-H1, and D-LF are available in either single phase or 3 phase voltages.
2. Motor rotation was set at the factory. For three phase machines, reversing the motor direction is done in the control cabinet by reversing the wires L1 and L2 on the disconnect side of the main electrical connection block. For single phase machines, motor rotation is changed at the motor connection plate on the rear of the single phase motor (If necessary).

Refer to Fig. 20 for the proper wiring of the pump motor for single and three phase voltages.

Figure 20
Pump Motor Wiring Diagrams



MECHANICAL SERVICE

Pump Seal Replacement

1. Disconnect the power to the machine at the main breaker panel or fuse box.
2. Drain the machine.
3. Remove the front and side panels.
4. Remove drain plug on the pump volute and drain the pump.
5. Remove the pump hoses.
6. Disconnect the wires to the motor at the motor junction box.
7. Unbolt motor from machine base and remove the pump/motor assembly.
8. Remove bolts on volute and carefully remove from the pump flange.
9. Lock the motor shaft with a wrench or pliers. The back of motor shaft is square.
10. Turn the impeller counter-clockwise to remove from shaft (right hand threads).
11. Remove the old seal and discard.
12. Check seal seat in the pump flange and clean thoroughly.
13. Press rubber seal/ceramic portion of seal assembly into the pump flange. Use a water soluble lubricant. Be careful to keep the ceramic clean.
14. Install the rotating part of the seal on the shaft with the graphite surface toward the ceramic. Use a water soluble lubricant on the rubber seal part only (not the graphite).
15. Reinstall impeller and new flange gasket. Reinstall bolts.
16. Reinstall the pump/motor assembly and reconnect the pump hoses.
17. Fill the dishwasher with water.
18. Check motor rotation by bump starting motor.
    Correct motor shaft rotation is clockwise when viewing motor from the rear.
19. Test run and check for leaks.

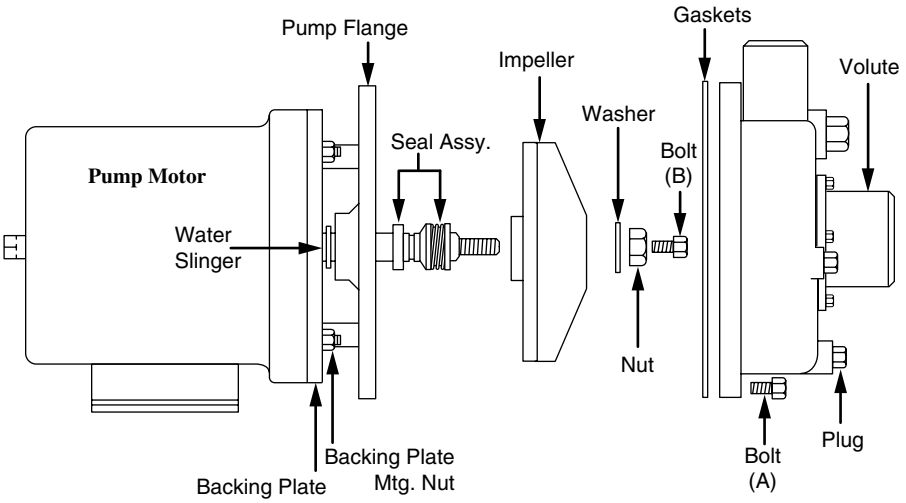


Figure 21
Pump Seal Replacement

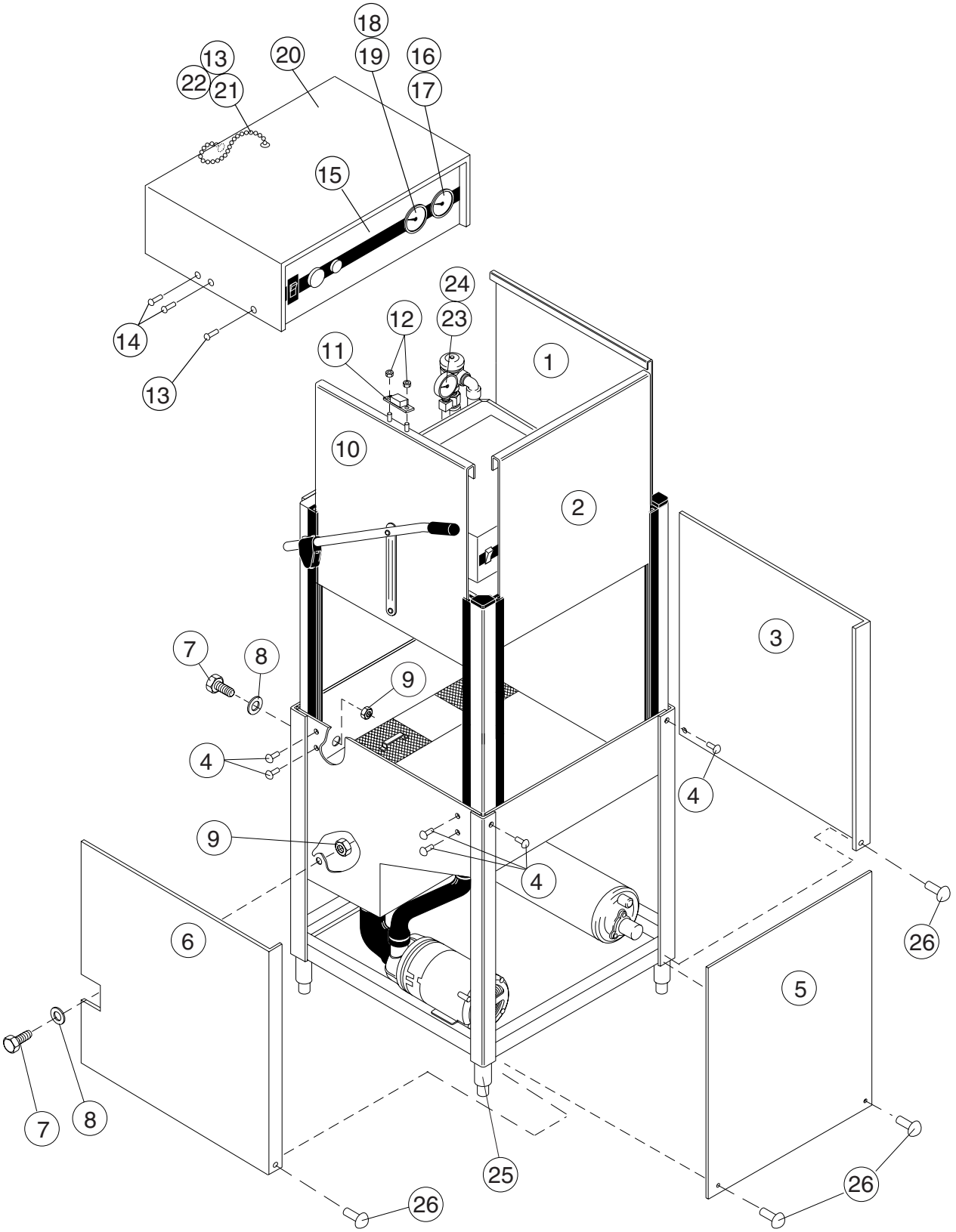


Figure 22 – D-HB/D-H1/D-LF
Doors, Panels and Gauges

D-HB/D-H1/D-LF

DOORS, PANELS AND GAUGES

Fig. 22 Item No.	Part No.	Part Description	Qty.
1	0709405	DOOR, SIDE RIGHT	1
2	0709402	FRONT DOOR, DOOR MACH	1
3	321929	RH PANEL NO CUT OUT	1
4	100779	SCREW 1/4-20 X 5/8 TRUSS HEAD	6
5	321932	FRONT PANEL	1
6	321941	LH PANEL W/CUTOUT	1
7	108418	PLUG PLASTIC	4
8	109034	WASHER 13/16 X 1 13/16 FIBER	4
9	108417	NUT, PLASTIC	4
10	0709404	DOOR, SIDE LEFT	1
11	111026	MAGNET SST	1
12	108954	NUT, GRIP 6/32 W/NYLON INSERT	2
13	100007	SCREW 10-32 X 3/8 TRUSS HEAD	2
14	0508752	SCREW 4-40 X 5/8 ROUND HEAD	2
15	0508668	DECAL CONTROL CABINET	1
16	108391	THERMOMETER 4FT (FINAL RINSE)	1
17	112090	OVERLAY, FINAL RINSE 180-195°F	1
	112092	OVERLAY, FINAL RINSE 120°F (D-LF ONLY)	1
18	107440	THERMOMETER 8FT (WASH)	1
19	112086	OVERLAY, WASH 150°F	1
	112093	OVERLAY, WASH 120°F (D-LF ONLY)	1
20	305404	CONTROL CABINET COVER	1
21	107367	CHAIN, BEAD #10	1
22	107368	CHAIN, END COUPLING	1
23	100135	GAUGE, PRESSURE (0-60 PSI)	1
24	109765	OVERLAY, PRESSURE GAUGE	1
25	0501873	FOOT, CAST GREY	4
26	0504822	SCREW 8-32 X 1/2 PAN HD SST	4

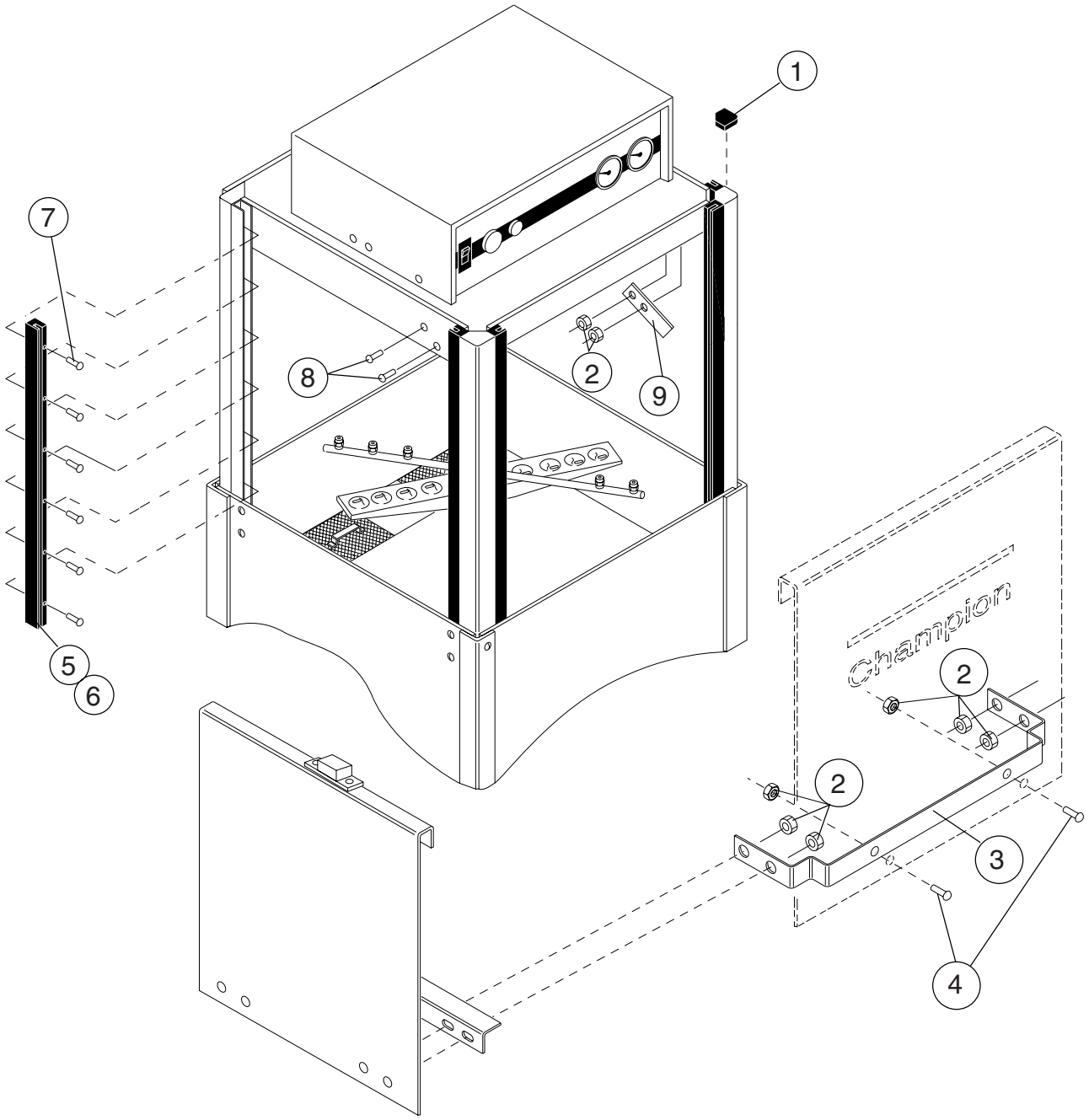


Figure 23 – D-HB/D-H1/D-LF
Door Guides, Stops, and Lift Bracket

D-HB/D-H1/D-LF

DOOR GUIDES, STOPS, AND LIFT BRACKET

Fig. 23 Item No.	Part No.	Part Description	Qty.
1	108053	PLUG, CORNERPOST	2
2	107966	NUT, GRIP 10-32 W/INSERT	8
3	0309277	BRACKET, DOOR LIFT	1
4	100097	SCREW 10-32 X 1/2" TRUSS HEAD	2
5	108347	GUIDE, DOOR	6
6	108410	GASKET, DOOR GUIDE (26")	12
7	107970	SCREW 8-32 X 1 FILISTER	36
8	100007	SCREW 10-32 X 3/8 TRUSS HEAD	2
9	0307328	STOP, DOOR	2

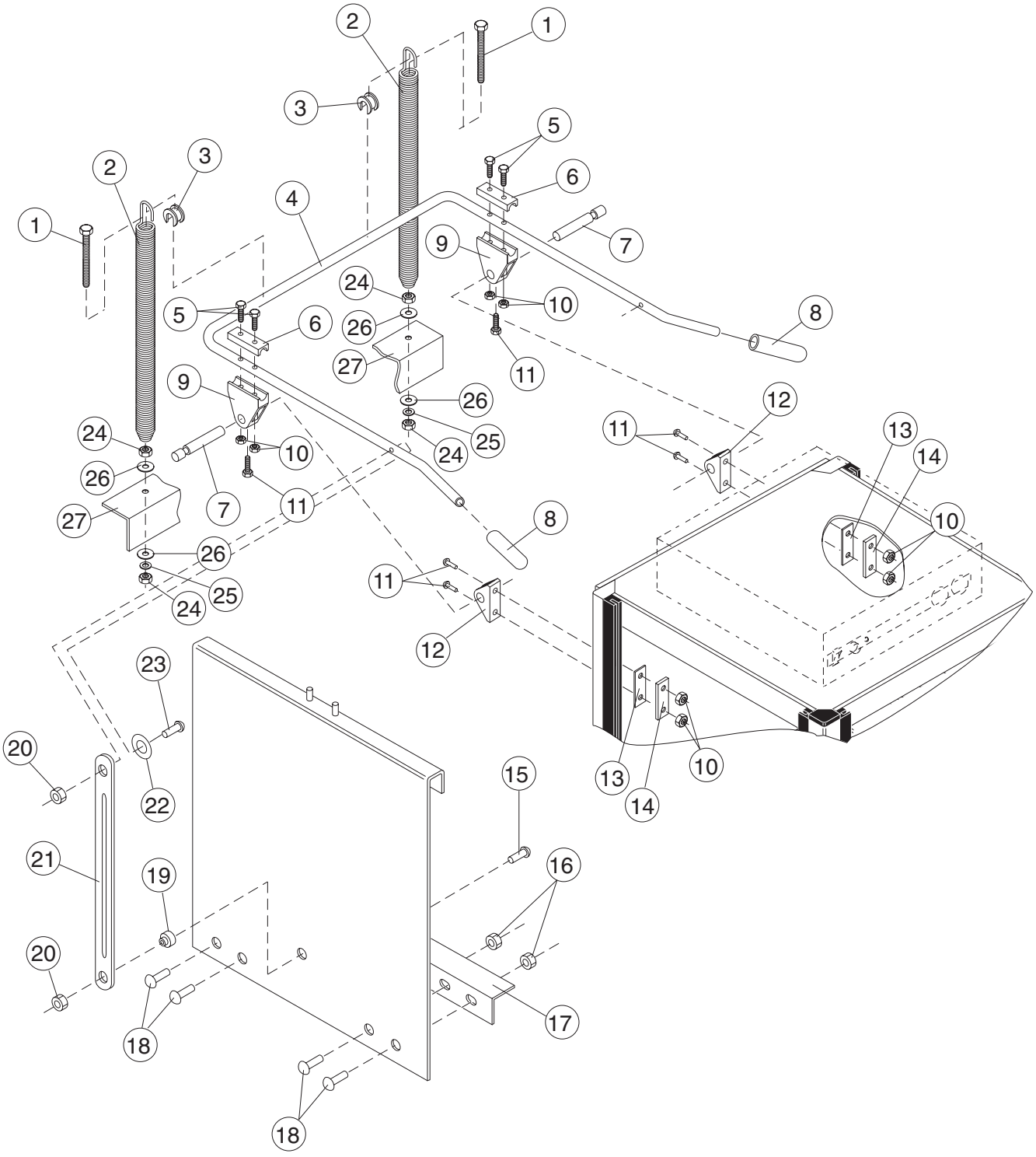


Figure 24 – D-HB/D-H1/D-LF
Door Handle and Spring Assembly

D-HB/D-H1/D-LF

DOOR HANDLE AND SPRING ASSEMBLY

Fig. 24 Item No.	Part No.	Part Description	Qty.
1	0509168	BOLT 5/16-18 X 11 HEX HEAD	1
2	108066	SPRING, EXTENSION	2
3	107397	BLOCK, SPRING HOOK	2
4	0509166	DOOR HANDLE	1
5	107437	BOLT M6 X 45MM HEX HEAD	4
6	107396	BLOCK, UPPER PIVOT	2
7	107393	PIN, PIVOT	2
8	107962	HANDLE, GRIP	2
9	107395	BLOCK, LOWER PIVOT	2
10	107420	NUT, PLAIN M6	8
11	107436	SCREW M6 X 16MM FILISTER	6
12	107399	SUPPORT, PIVOT BLOCK	2
13	304811	GASKET, BACKING	2
14	108368	PLATE, BACKING	2
15	100740	BOLT 5/16-18 X 1 HEX HEAD	2
16	107966	NUT, GRIP 10-32 W/NYLON INSERT	8
17	322077	GUARD, SPLASH	2
18	100097	SCREW 10-32 X 1/2 TRUSSHEAD	8
19	0509264	BUSHING, SIDE DOOR	2
20	0509274	NUT, ACORN 5/16-18 SST	2
21	0309167	LIFT BAR, DOOR	2
22	102376	WASHER, FLAT	2
23	104002	BOLT 5/16-18 X 1-1/2	2
24	100154	NUT, PLAIN 5/16-18	4
25	106013	WASHER, LOCK 5/16 SPLIT	2
26	102376	WASHER 5/16 X 3/4 X 1/16	4
27	321927	SPRING ANCHOR BRACKET	1

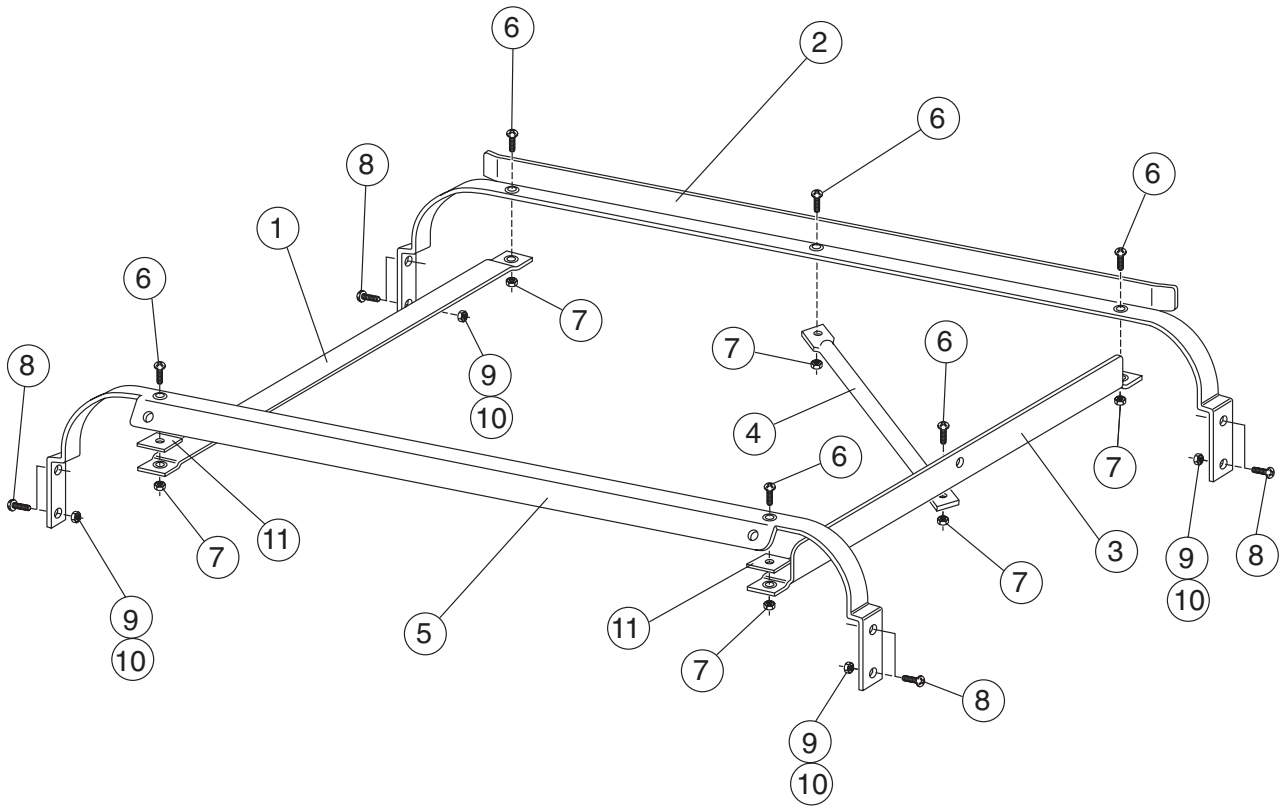


Figure 25 – D-HB/D-H1/D-LF
Track Assembly

D-HB/D-H1/D-LF
TRACK ASSEMBLY

Fig. 25 Item No.	Part No.	Part Description	Qty.
1	0309469	Guide, right hand	1
2	0309472	Track, rear	1
3	0309468	Guide, left hand	1
4	0309470	Support, rack	1
5	0309471	Track, front	1
6	106727	Screw (10-32 x 5/8 Flat Hd)	6
7	107966	Nut, grip (10-32 w/nylon insert)	6
8	100779	Bolt (1/4 -20 x 5/8 Truss Hd)	8
9	106482	Washer, lock	8
10	100003	Nut (1/4-20 Hex Hd)	8
11	0309473	Spacer	2

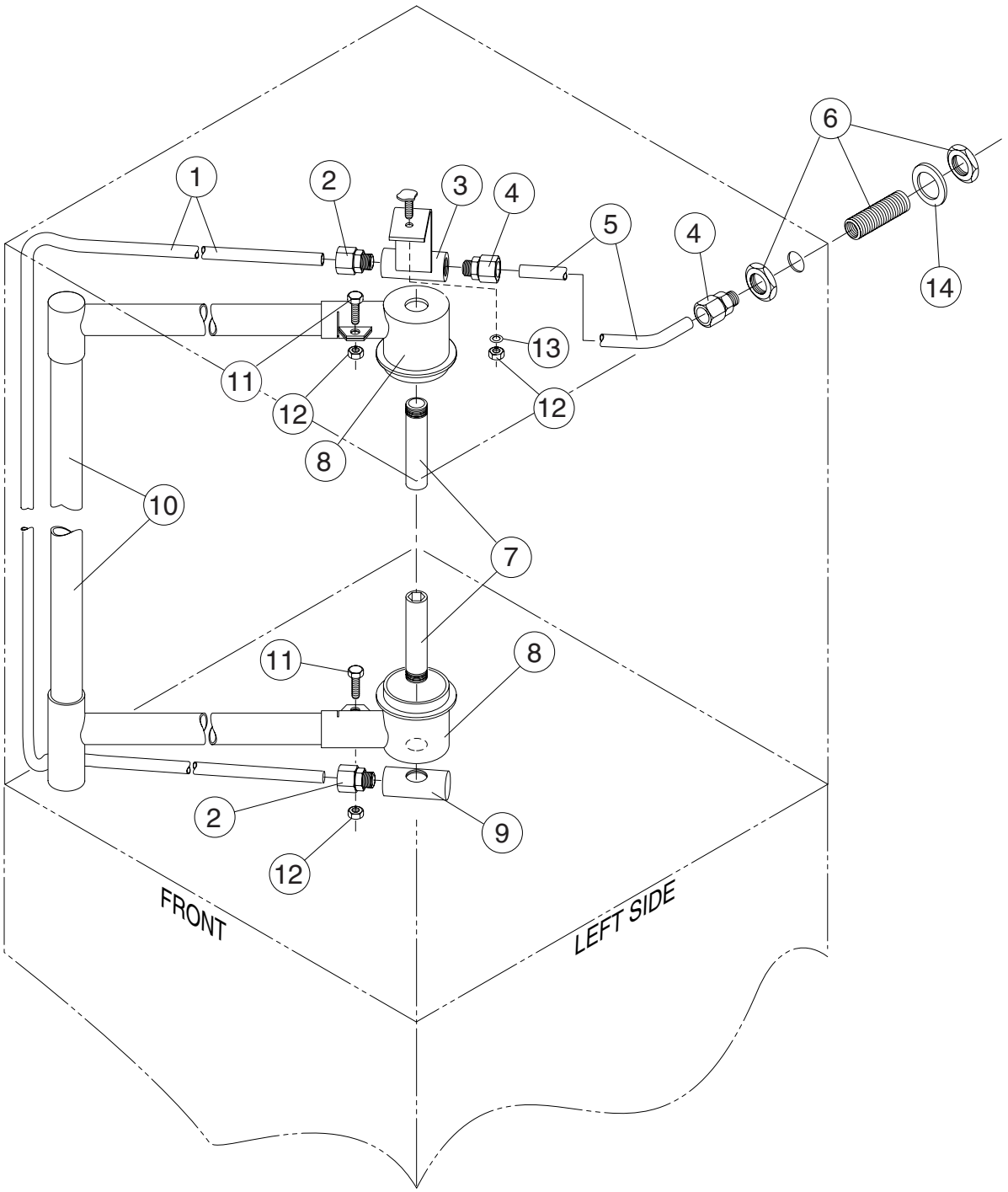


Figure 26 – D-HB/D-H1/D-LF
Wash/Rinse Spray Piping

D-HB/D-H1/D-LF
WASH/RINSE SPRAY PIPING

Fig. 26 Item No.	Part No.	Part Description	Qty.
1	0309444	RINSE TUBE	1
2	0509181	FITTING, STRAIGHT COMPRESSION	2
3	0509150	CONNECTOR, TOP RINSE	1
4	0509180	FITTING, STRAIGHT COMPRESSION	2
5	0309445	RINSE TUBE, TOP	1
6	0509179	FITTING, BULKHEAD 1/2"NPT	1
7	0507445	SPINDLE, WASH ARM	2
8	109864	SUPPORT, WASH ARM	2
9	0509178	CONNECTOR, BOTTOM RINSE	1
10	109781	STANDPIPE, WASH	1
11	100736	BOLT 1/4-20 X 3/4 HEX HEAD	2
12	107967	NUT, GRIP 1/4-20	1
13	106482	WASHER, SPLIT LOCK SST	2
14	0309350	WASHER	1

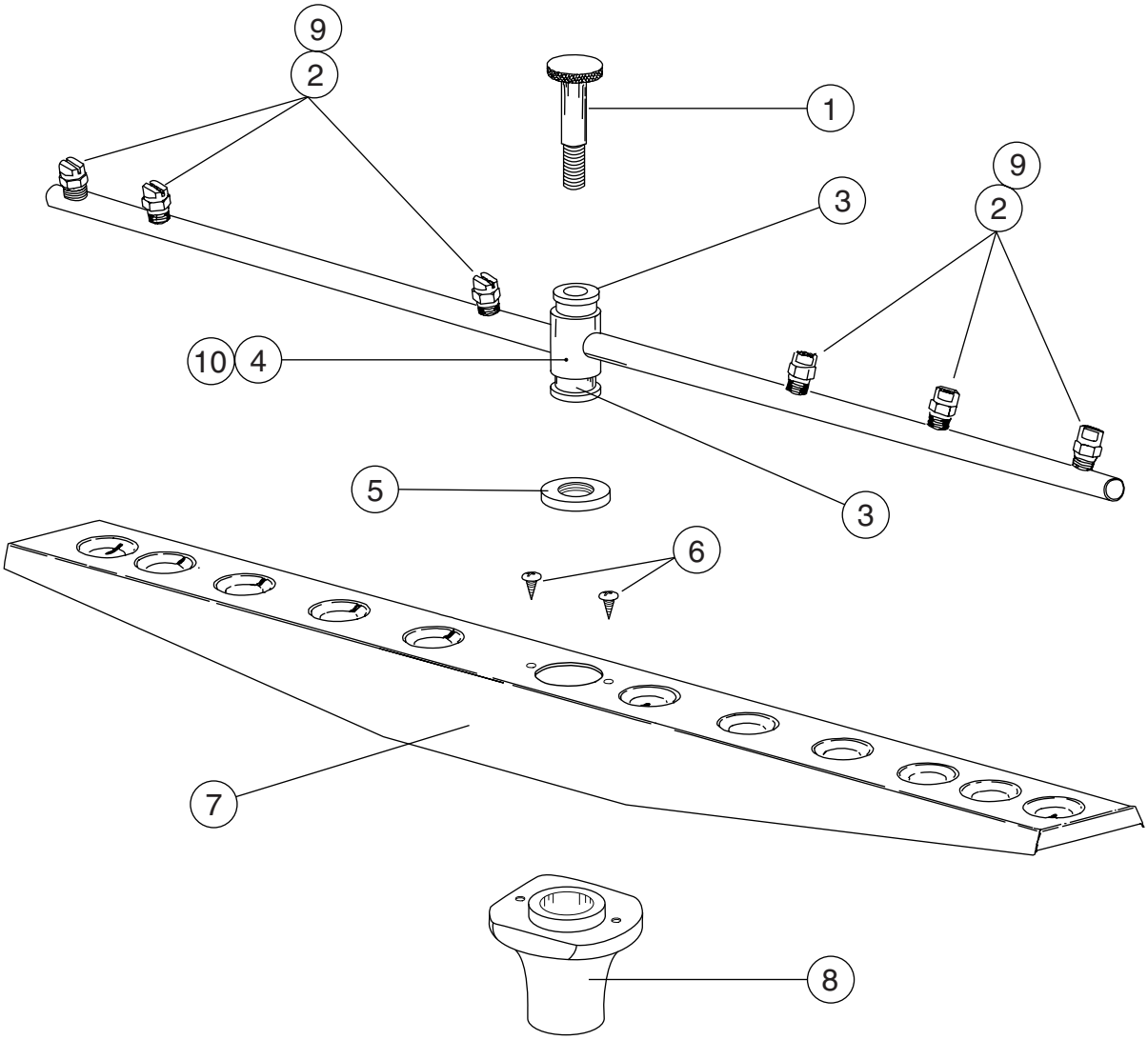


Figure 27– D-HB/D-H1/D-LF
Wash/Rinse Spray Arms

D-HB/D-H1/D-LF
WASH/RINSE SPRAY ARMS

Fig. 27 Item No.	Part No.	Part Description	Qty.
1	0507443	SPINDLE, RINSE ARM	2
2	0508376	NOZZLE, RINSE ARM (DHB, D-H1 only)	12
3	112164	BEARING, RINSE ARM	4
4	0707453	RINSE ARM ASSY. (Includes 2 & 3)	2
5	0507444	NUT, RINSE ARM	2
6	109835	SCREW (#8 X 1/2 PAN HD)	4
7	0707452-S	WASH ARM ASSY. (Includes 6 & 8)	2
8	0507446	BEARING,WASH ARM	2
9	0507451	NOZZLE RINSE ARM (SST) (Model D-LF only)	12
10	0708899	RINSE ARM ASSY. (Model D-LF only) (Includes 3 & 9)	1
—	0707450	RINSE ARM (Does not include items 2 3, or 9)	
—	0707456	WASH ARM (Does not include item 8)	

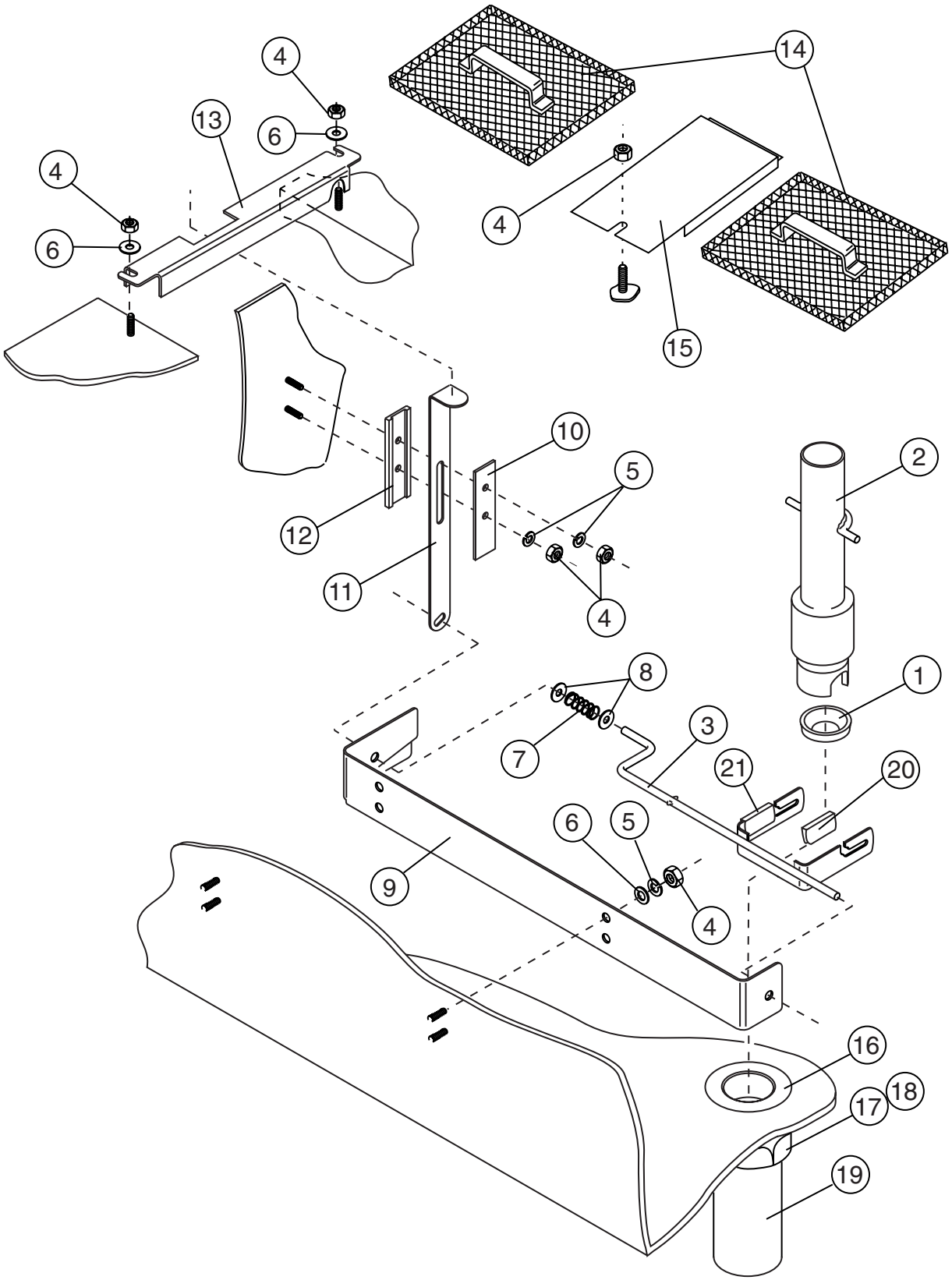


Figure 28 – D-HB/D-H1/D-LF
Drain Assembly and Scrap Screens

D-HB/D-H1/D-LF

DRAIN ASSEMBLY AND SCRAP SCREENS

Fig. 28 Item No.	Part No.	Part Description	Qty.
1	110427	SEAL OVERFLOW TUBE	1
2	112468	OVERFLOW WELDMENT	1
3	112469-S	OVERFLOW LIFT ARM WELDMENT (Must order with item 11 for machines built prior to S/N 91586) (For machines beginning with S/N 91586 and above, order separately)	1
4	100003	NUT PLAIN 1/4-20 SST	9
5	106482	WASHER LOCK 1/4 SPLIT	3
6	106026	WASHER 1/4 X 5/8 X 1/16 SST	3
7	111391	LIFT ARM SPRING	1
8	102376	WASHER 5/16 X 3/4 X 1/16	2
9	322217	ACTUATOR MOUNTING BRACKET	1
10	112463	ACTUATOR KEEPER PLATE	1
11	322218	ACTUATOR	1
12	112462	OVERFLOW ACTUATOR GUIDE	1
13	322216	LH FILLER PLATE	1
14	305164	SCREEN, SCRAP (10-3/8”)	2
15	322215	CENTER SCREEN FILLER PLATE	1
16	205813	DRAIN BASKET	1
17	112044	SLIP NUT	1
18	112045	WASHER, TAILPIECE	1
19	107473	TAILPIECE	1
20	322547-1	RETAINER, CLIP RH	1
21	322547-2	RETAINER, CLIP LH	1

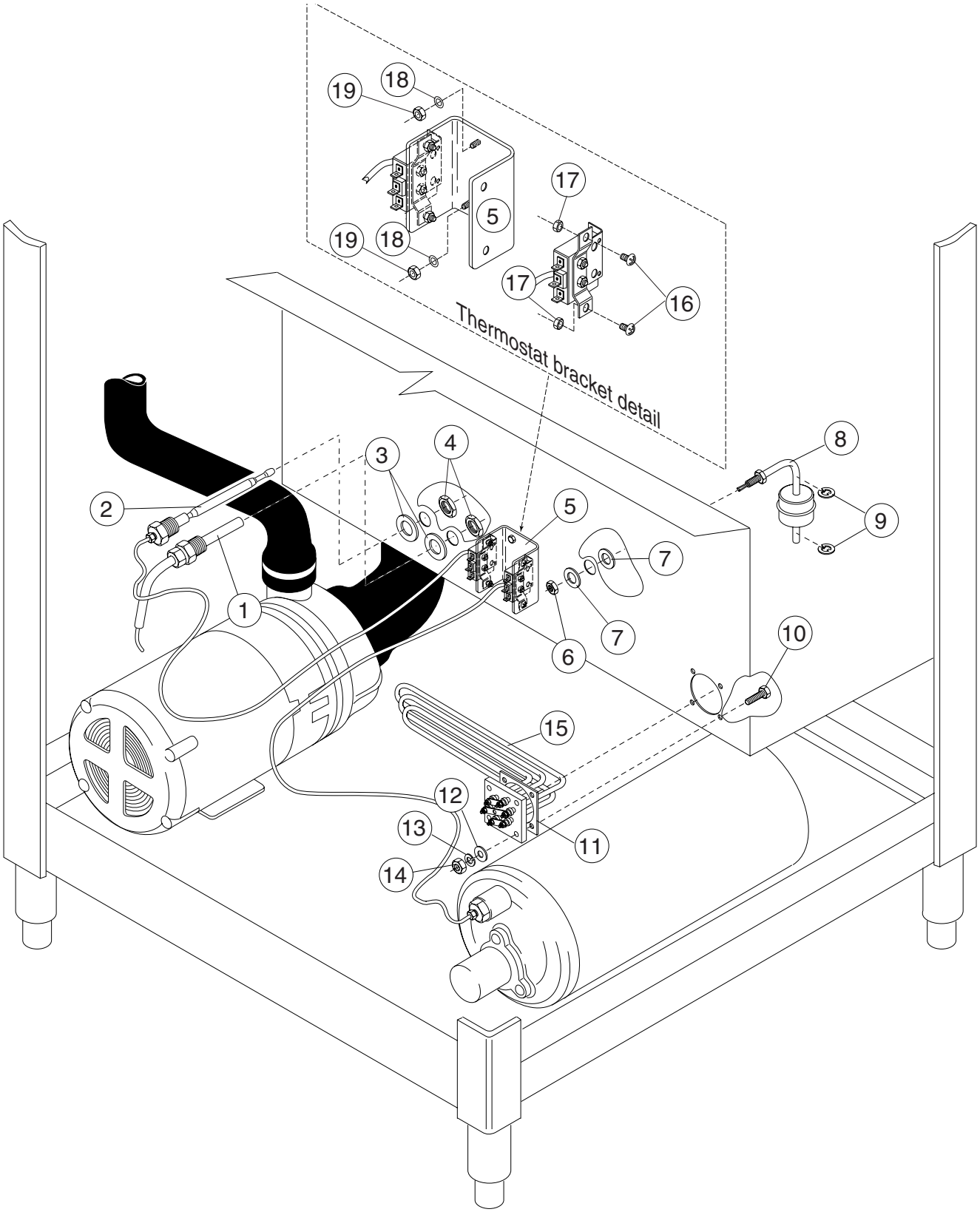


Figure 29 – D-HB/D-H1/D-LF
Wash Tank Heat, Thermostats, and Float Switch

D-HB/D-H1/D-LF

WASH TANK HEAT, THERMOSTATS AND FLOAT SWITCH

Fig. 29 Item No.	Part No.	Part Description	Qty.
1	107440	THERMOMETER 8 FT.	1
2	109069	THERMOSTAT W/CAP 110-220%F	1
3	201041	WASHER.	2
4	201029	NUT, LOCK 1/2"	2
5	322076	DUAL THERMOSTAT BRACKET	1
6	107089	NUT, JAM 1/2-13	1
7	104882	WASHER	2
8	111092	FLOAT SWITCH	1
9	111151	C-CLIP FLOAT SWITCH	2
10	100740	BOLT 5/16-18 X 1 HEX HEAD	4
11	108345	GASKET 3 X 3 X 1/8 2"	1
12	102376	WASHER 5/16 X 3/4 X 1/16	8
13	106013	WASHER, LOCK 5/16 SPLIT	4
14	100154	NUT, PLAIN 5/16-18 SST	4
15	0509637	HEATER 3KW 115V/1PH	1
	0509185	HEATER 3KW 208-240/380-415V 1/3PH	1
	0509373	HEATER 3KW 460V/3PH	1
	0507707	HEATER 3KW 575V/3PH	1
16	100007	SCREW 10-32 X 3/8 TRUSS HEAD	4
17	107966	NUT, GRIP 10-32 W/NYLON INSERT	4
18	106482	WASHER, LOCK 1/4 SPLIT	4
19	100003	PLAIN NUT 1/4-20 SST	4
—	104889	PUTTY, SEALING (USED TO SEAL ITEMS 1,2,8)	A/R

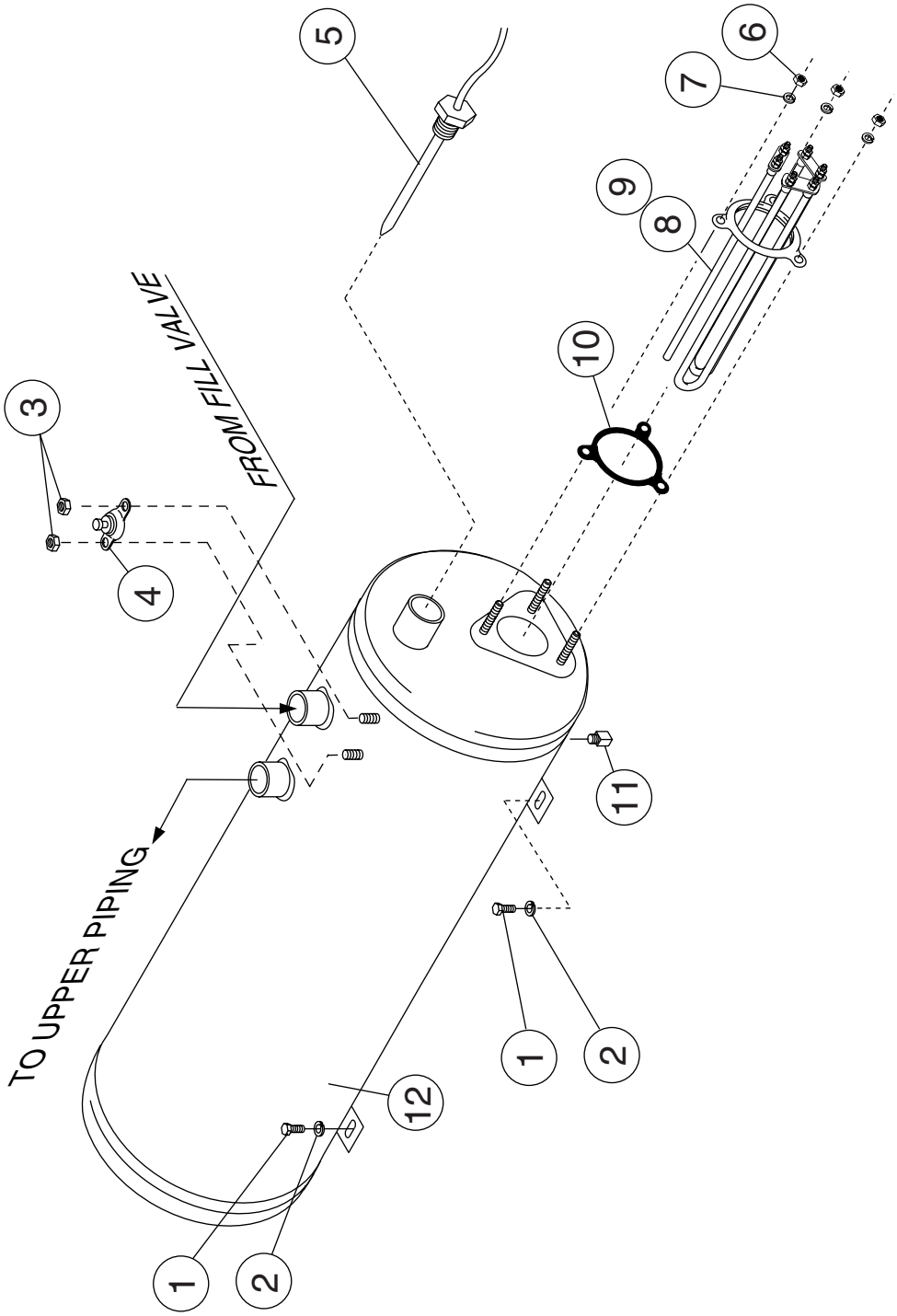


Figure 30 – D-HB Only
Electric Booster and Thermostat

D-HB ONLY

ELECTRIC BOOSTER AND THERMOSTAT

Fig. 30 Item No.	Part No.	Part Description	Qty.
1	100740	BOLT 5/16-18 X 1 HEX HEAD	2
2	102376	WASHER, FLAT 5/16 X 3/4 X 1/16	2
3	108954	NUT, GRIP 6-32 W/INSERT	2
4	110562	THERMOSTAT, HIGH LIMIT	1
	110563	COMPOUND, HEAT SINK	A/R
5	109069	THERMOSTAT, BOOSTER	1
6	100003	NUT, PLAIN 1/4-20 SST	3
7	106482	WASHER, LOCK 1/4 SPLIT	3
8	111233	HEATER 9KW 208-240/380-415V, 40°Rise (1 & 3 phase)	1
	108579	HEATER 9KW 480V, 40°Rise (3 phase only)	1
	111122	HEATER 9KW 575V, 40°Rise (3 phase only)	1
9	111266	HEATER 18KW 208-240/380-415V, 70°Rise (1 & 3 phase)	1
	111267	HEATER 18KW 480V, 70°Rise (3 phase only)	1
	111600	HEATER 18KW 575V, 70°Rise (3 phase only)	1
10	109985	SEAL, ELECTRIC HEATER	1
11	100210	PLUG 1/8 SST	1
12	0509042	TANK, BOOSTER	1

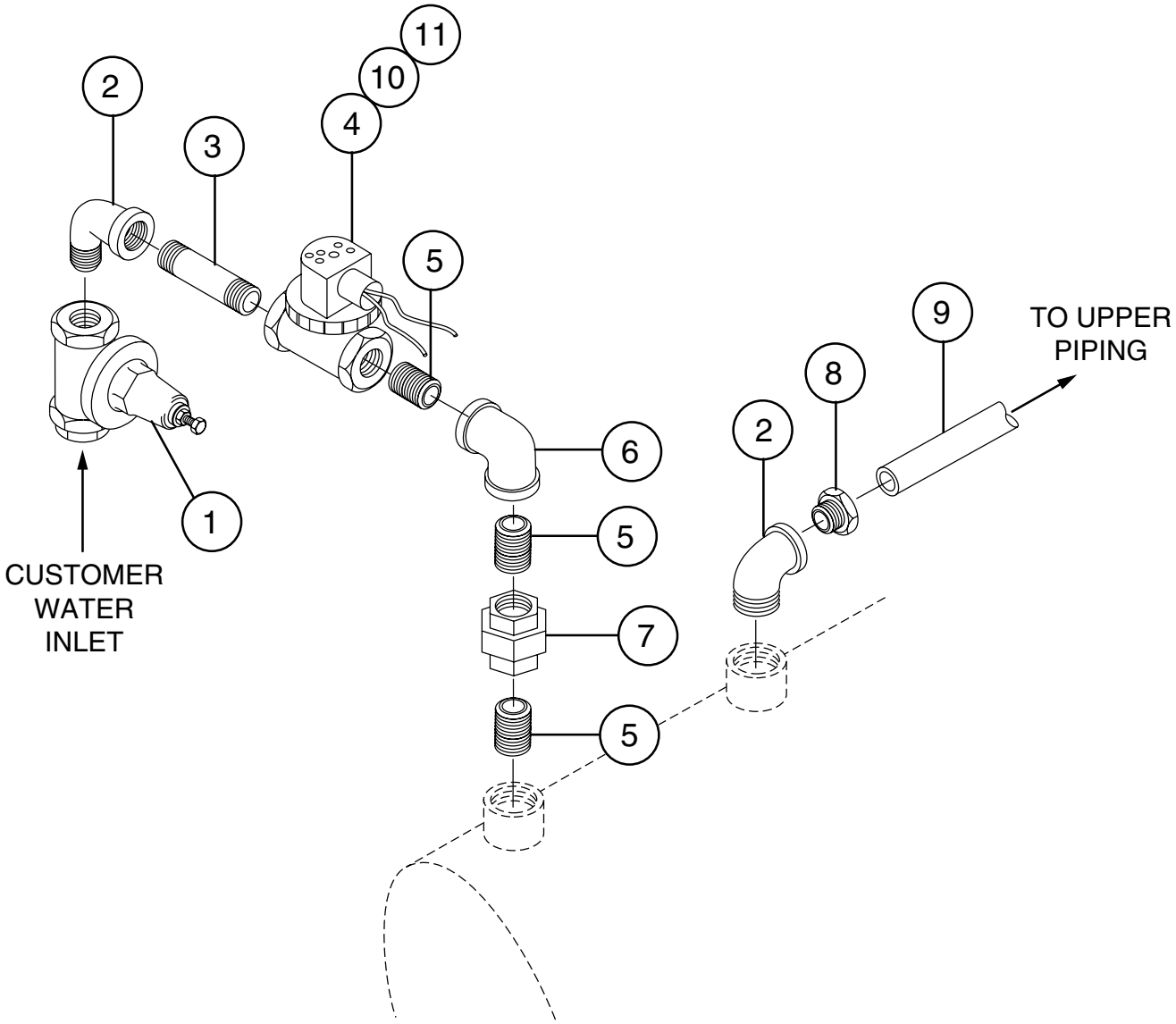


Figure 31 – D-HB ONLY
Lower Fill Piping Assembly

D-HB ONLY

LOWER FILL PIPING ASSEMBLY

Fig. 31 Item No.	Part No.	Part Description	Qty.
1	112387	LINE STRAINER/PRV COMBO	1
2	102444	STREET ELL 3/4" NPT BRASS	2
3	102651	NIPPLE 3/4" x 2" BRASS	1
4	111437	VALVE 3/4" NPT HOT WATER	1
5	100184	NIPPLE 3/4" NPT	3
6	102442	ELBOW 3/4"NPT X 90°	1
7	100571	UNION 3/4" NPT BRASS	1
8	109879	COMPRESSION FITTING 3/4" X 7/8"	1
9	205761	3/4" COPPER TUBE (FORMED)	1
10	108516	COIL, SOLENOID VALVE (120v)	1
11	109903	REPAIR KIT, 3/4" SOLENOID VALVE	1

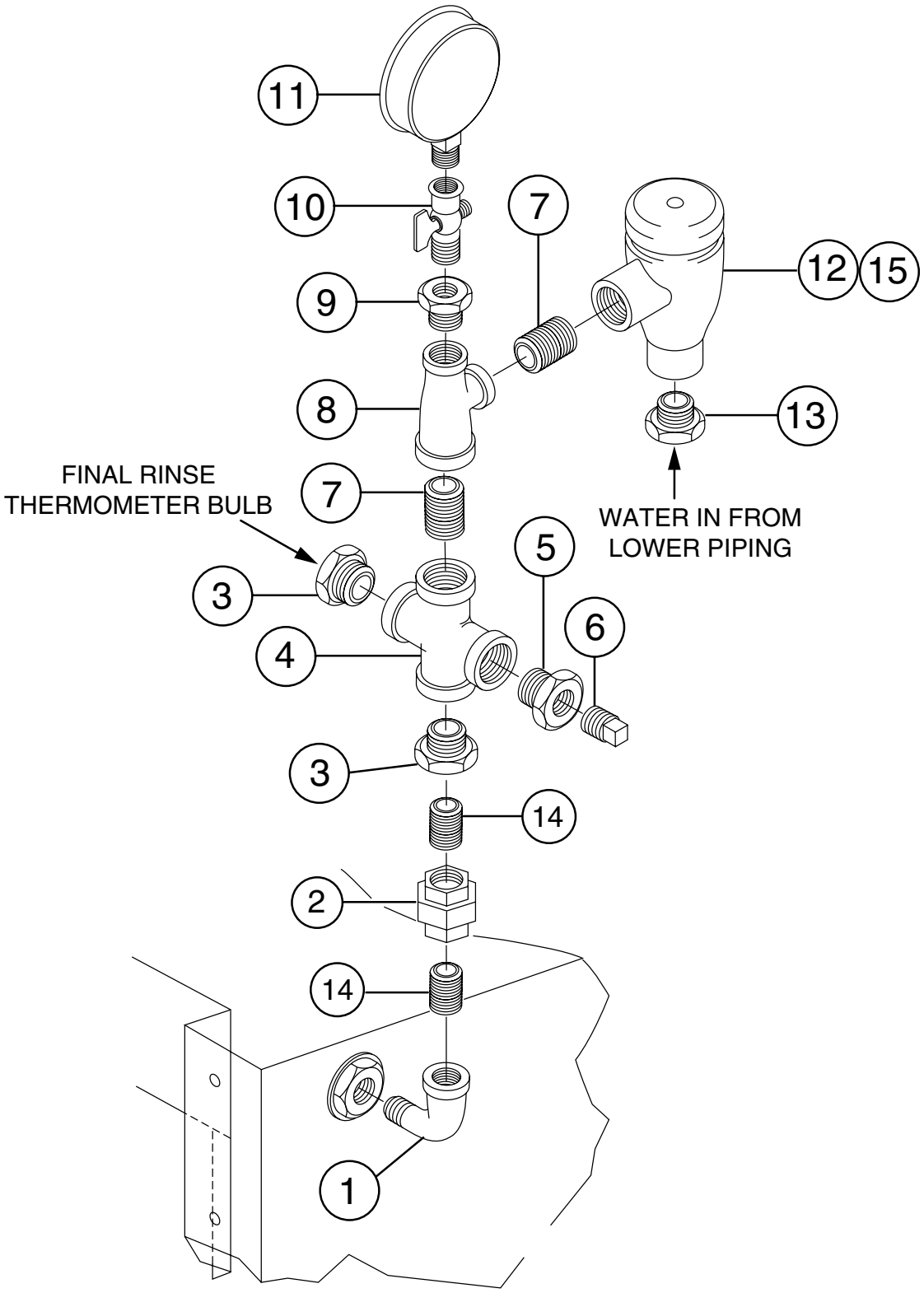


Figure 32 – D-HB/D-H1
Upper Fill Piping Assembly

D-HB/D-H1

UPPER FILL PIPING ASSEMBLY

Fig. 32 Item No.	Part No.	Part Description	Qty.
1	102438	ELBOW, STREET 1/2" NPT X 90 BRASS	1
2	102549	UNION 1/2" NPT BRASS	1
3	102392	BUSHING, RED 3/4"NPT X 1/2" NPT BRASS	2
4	100599	CROSS 3/4" NPT BRASS	1
5	108181	BUSHING,RED 3/4" X 1/4" NPT PLASTIC	1
6	107463	PLUG, 1/4" NPT PLASTIC	1
7	100184	NIPPLE 3/4" NPT CLOSE BRASS	2
8	102525	TEE 3/4" X 1/2" X 3/4" NPT BRASS	2
9	102388	BUSHING,RED 1/2" NPT X 1/4" NPT	1
10	112437	NEEDLE VALVE 1/4" NPT BRASS	1
11	100135	PRESSURE GAUGE 0-60PSI	1
12	104429	VACUUM BREAKER 3/4" NPT BRASS	1
13	109879	COMPRESS FITTING 3/4NPT X 7/8OD	1
14	100209	NIPPLE 1/2" NPT BRASS	2
15	108351	REPAIR KIT, 3/4" VACUUM BREAKER	1

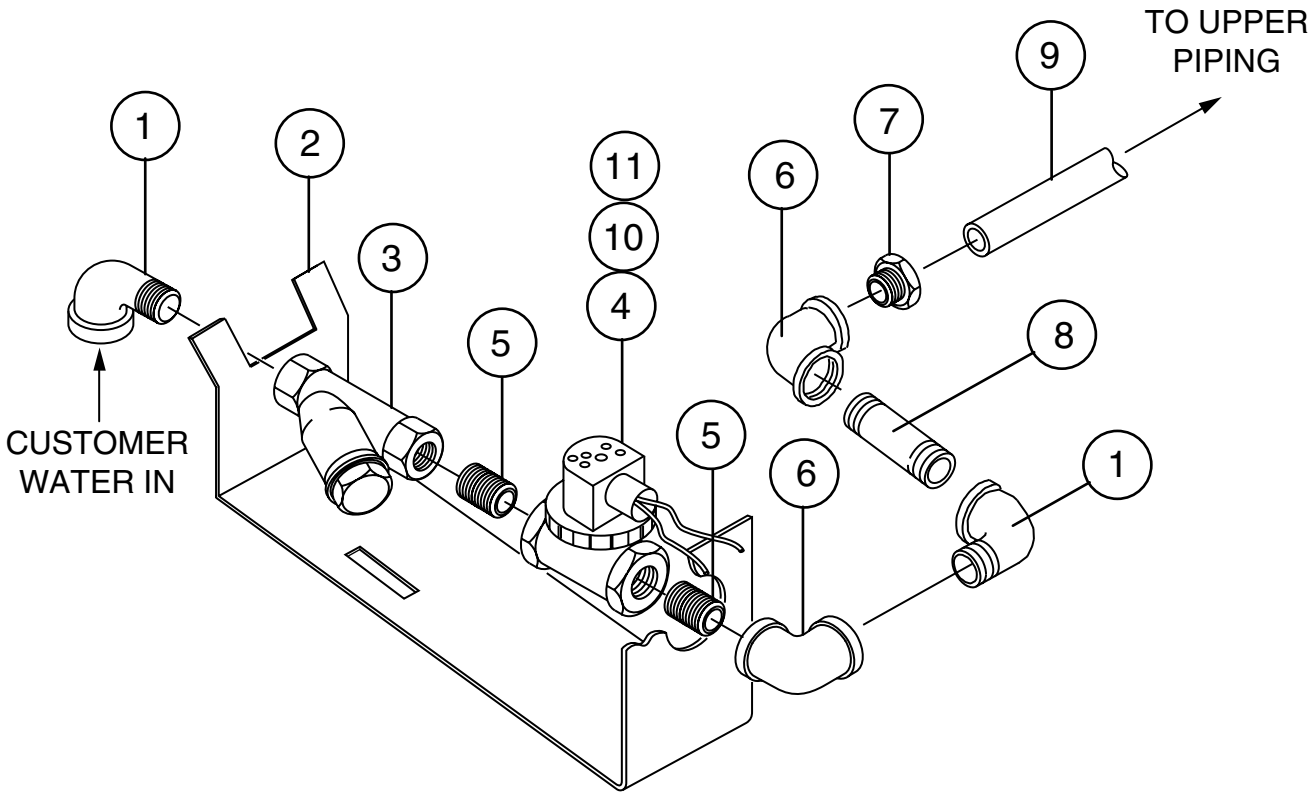


Figure 33 – D-H1/D-LF
Lower Fill Piping Assembly

D-H1/D-LF
LOWER FILL PIPING ASSEMBLY

Fig. 33 Item No.	Part No.	Part Description	Qty.
1	102444	STREET ELL 3/4" NPT BRASS	2
2	0309340	PLUMBING SUPPORT BRACKET	1
3	110768	LINE STRAINER 3/4" BRASS	1
4	111437	VALVE 3/4" NPT HOT WATER	1
5	100184	NIPPLE 3/4" NPT CLOSE BRASS	2
6	102442	ELBOW 3/4" NPT BRASS	2
7	109879	COMPRESSION FITTING 3/4"NPT X 7/8	1
8	102470	NIPPLE 3/4" NPT X 3" BRASS	1
9	205761	TUBE 3/4" COPPER (FORMED)	1
10	108516	COIL, SOLENOID VALVE (120v)	1
11	109903	REPAIR KIT, 3/4" SOLENOID VALVE	1

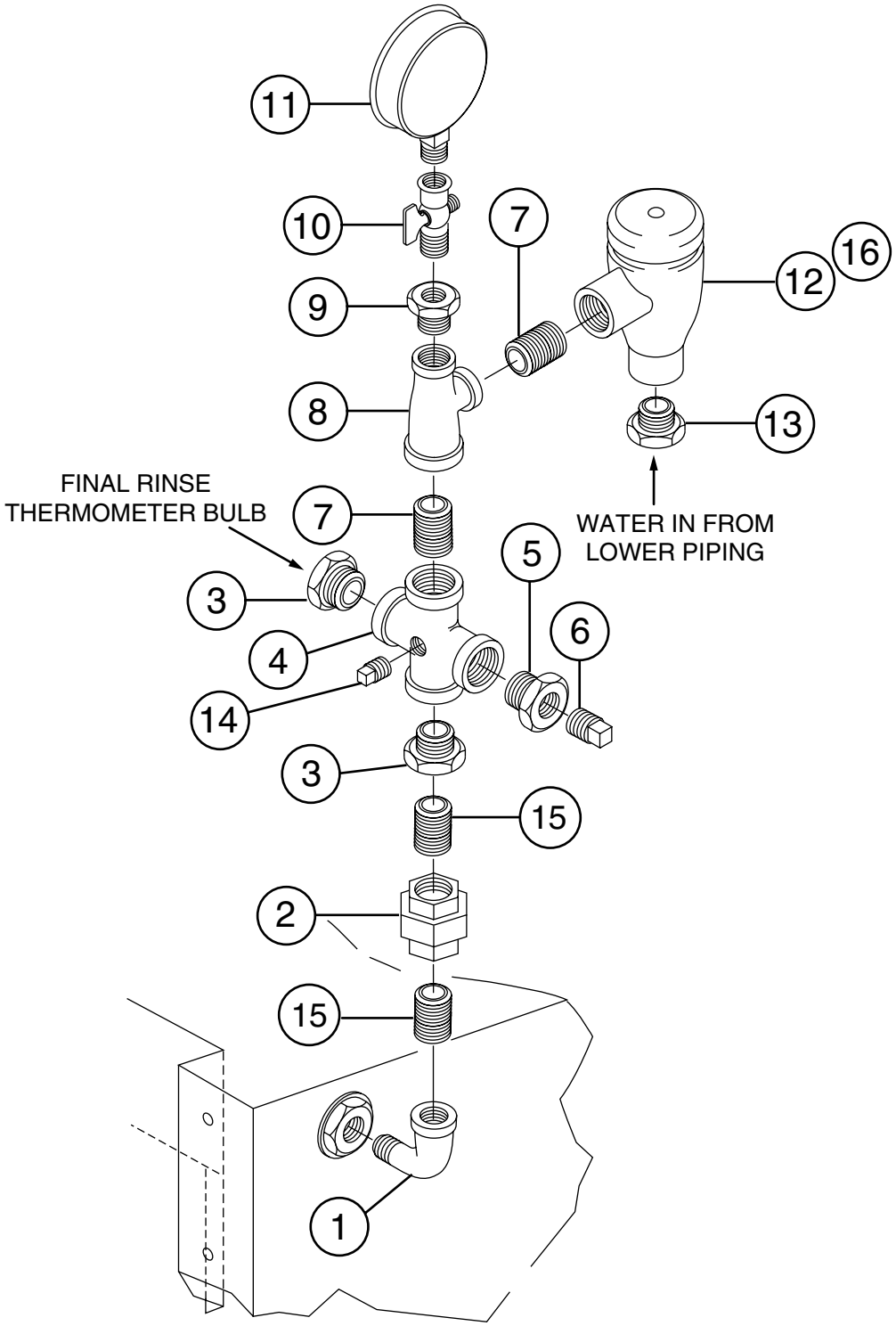


Figure 34 – D-LF
Upper Fill Piping Assembly

D-LF

UPPER FILL PIPING ASSEMBLY

Fig. 34 Item No.	Part No.	Part Description	Qty.
1	102438	ELBOW, STREET 1/2" NPT X 90 BRASS	1
2	102549	UNION 1/2" NPT BRASS	1
3	102392	BUSHING, RED 3/4" NPT X 1/2 NPT BRASS	2
4	0309529	MODIFIED CROSS 3/4" NPT BRASS	1
5	108181	BUSHING,RED 3/4" X 1/4" NPT PLASTIC	1
6	107463	PLUG, 1/4" NPT PLASTIC	1
7	100184	NIPPLE 3/4" NPT CLOSE BRASS	2
8	102525	TEE 3/4" X 1/2" X 3/4" NPT BRASS	2
9	102388	BUSHING,RED 1/2" NPT X 1/4" NPT	1
10	112437	NEEDLE VALVE 1/4" NPT BRASS	1
11	100135	PRESSURE GAUGE 0-60PSI	1
12	104429	VACUUM BREAKER 3/4" NPT BRASS	1
13	109879	COMPRESS FITTING 3/4" NPT X 7/8OD	1
14	107424	PLUG 1/8" NPT PLASTIC	1
15	100209	NIPPLE, 1/2" CLOSE BRASS	2
16	108351	REPAIR KIT, 3/4" VACUUM BREAKER	1

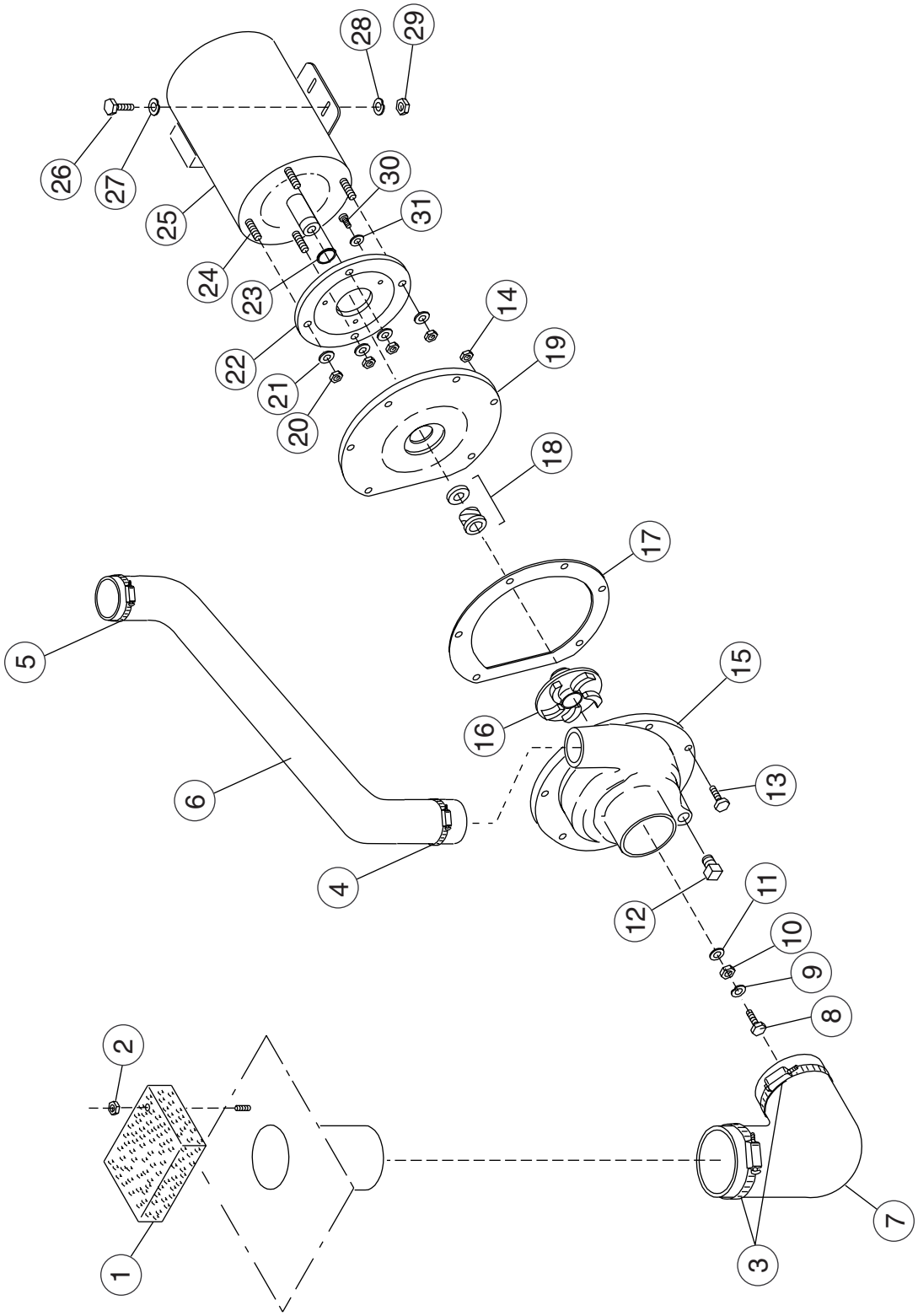


Figure 35 – D-HB/D-H1/D-LF
Pump Assembly

D-HB/D-H1/D-LF
PUMP ASSEMBLY

Fig. 35 Item No.	Part No.	Part Description	Qty.
1	308005	STRAINER	1
2	107966	NUT, GRIP 10-32 W/NYLON INSERT	1
3	104203	CLAMP, HOSE	2
4	104165	CLAMP, HOSE	1
5	107340	CLAMP, HOSE	1
6	112383	HOSE PUMP DISCHARGE	1
7	109562	HOSE, SUCTION	1
8	100734	BOLT 1/4-20 X 1/2” HEX HEAD	1
9	106482	WASHER, LOCK 1/4" SPLIT	1
10	110247	NUT, HEX JAM 7/16-20	1
11	110248	WASHER, FLAT	1
12	107463	PLUG 1/4"	1
13	107137	BOLT 10-32 X 7/8 HEX HEAD	11
14	100194	NUT, GRIP (10-32)	11
15	109651	VOLUTE	1
16	111143	IMPELLER	1
17	109653	GASKET, O-RING	1
18	111111	PUMP SEAL	1
19	109649	BACK PUMP HOUSING	1
20	107690	NUT, JAM 3/8-16	4
21	106407	WASHER, LOCK 3/8" SPLIT	4
22	204460	BACKING PLATE, MACHINED	1
23	109654	PUMP SLINGER WASHER	1
24	110734	STUD 3/8-16 X 1 3/8.	4
25	111145	MOTOR 1.4HP (208-240V/ 460V/60/3).	1
	111144	MOTOR 1.4HP (115V/208-240V/60/1)	1
	0507708	MOTOR 1.4HP (575V/60V3PH)	1
26	100739	BOLT 5/16-18 X 3/4 HEX HEAD	4
27	102376	WASHER, FLAT 5/16	4
28	106013	WASHER, LOCK 5/16-18 SST	4
29	100142	NUT, GRIP 5/16-18	4
30	100754	SCREW, FLAT 10-32 X 1/2”	4
31	110270	WASHER, COUNTERSUNK SST.	4
—	109645	KIT, PUMP (INCLUDES 15,17,19)	1
—	451643	PUMP/MOTOR ASSEMBLY Complete 1.4HP(208-240v/460v/60/3ph)	1
—	451642	PUMP/MOTOR ASSEMBLY Complete 1.4HP(115v/208-240V/60/1ph)	1
—	0707549	PUMP/MOTOR ASSEMBLY Complete 1.4HP(575V/60/3ph)	1

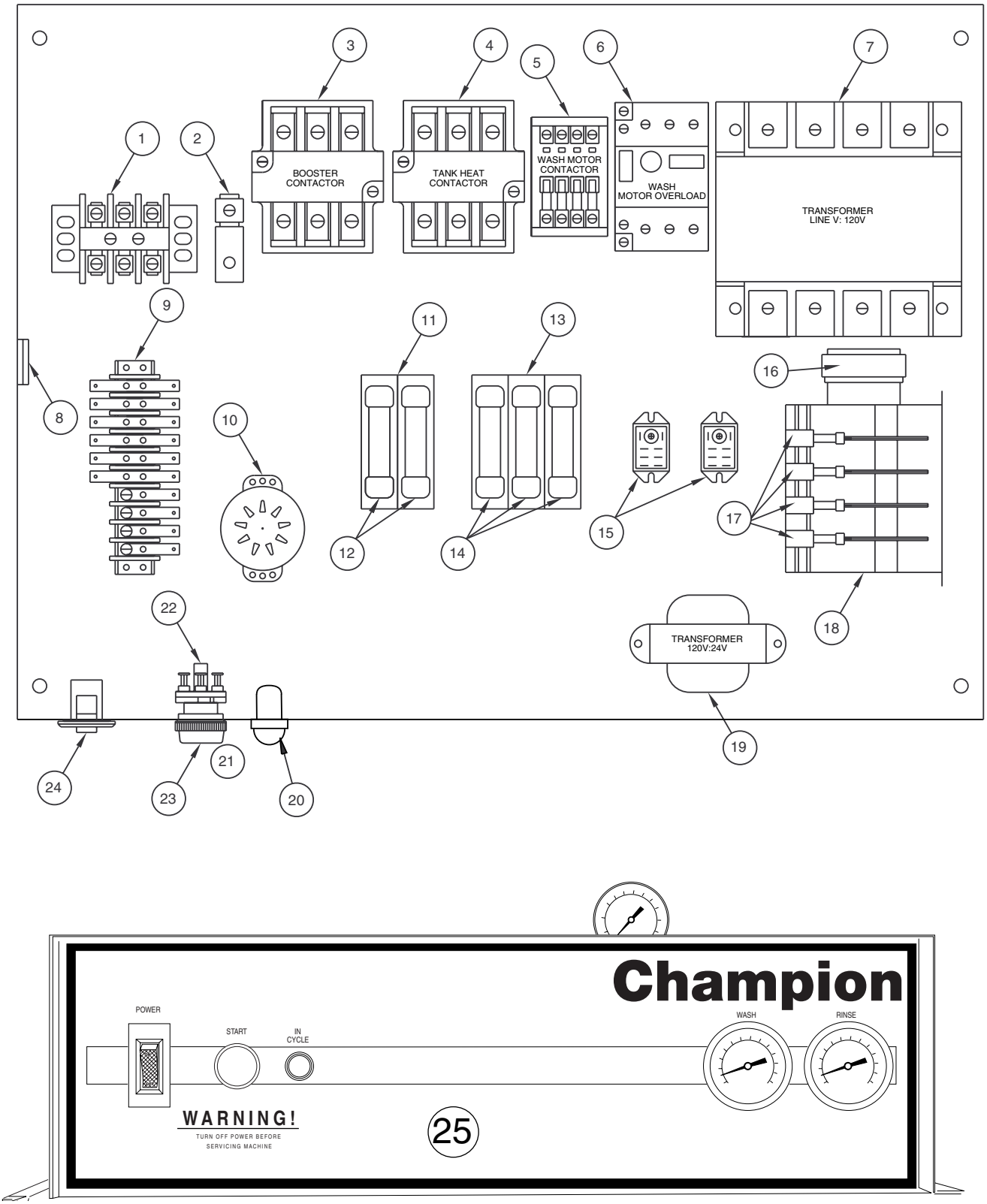


Figure 36 – D-HB/D-H1/D-LF
Control Cabinet

D-HB/D-H1/D-LF
CONTROL CABINET

Fig. 36 Item No.	Part No.	Part Description	Qty.
1	100292	Terminal block, 1 Phase	1
1	106010	Terminal block, 3 Phase	1
2	103309	Wire lug, ground	1
3	111702	Contactor, booster (All voltages/3PH) 40° and 70° rise	1
4	111702	Contactor, tank heat (All voltages) 1 & 3 Phase	1
5	111642	Contactor, wash motor (All voltages) 1 & 3 Phase	1
6	111632	Overload, motor, manual-1.4 HP Wash (115V/1PH)	1
6	111630	Overload, motor, manual-1.4 HP Wash (208-240V/1PH)	1
6	112691	Overload, motor, manual-1.4 HP Wash (208-240V/3PH)	1
6	111627	Overload, motor, manual-1.4 HP Wash (380-415V/3PH)	1
6	111626	Overload, motor, manual-1.4 HP Wash (480V/3PH)	1
6	112692	Overload, motor, manual-1.4 HP Wash (575V/3PH)	1
7	109064	Transformer, control (208-240V/3PH, 480V/3PH)	1
7	111464	Transformer, control (380-415V/3PH)	1
7	111521	Transformer, control (575V/3PH)	1
8	111090	Reed switch, magnetic	1
9	0508895	Terminal block	1
10	0508469	Timer, fill assembly	1
11	106402	Fuse block, 2 Pole (1 & 3 Phase)	1
12	107289	Fuse 2.5A (208-240V/1PH)	2
12	107289	Fuse 2.5A (208-240V/3PH)	2
12	0508707	Fuse 1A (380-415V/3PH)	2
12	0508707	Fuse 1A (480V/3PH)	2
12	0508708	Fuse 2.5A (575V/3PH)	2
13	106925	Fuse block, 3 Pole (1 & 3 Phase)	1
14	0508676	Fuse 30A (115V/1PH)	3
14	107384	Fuse 20A (208-240V/1PH)	3
14	0508675	Fuse 10A (208-240V/3PH)	3
14	100913	Fuse 10A (380-415V/3PH)	3
14	100906	Fuse 5A (480-575V/3PH)	3
15	111067	Relay, 24V	2
16	0508773	Motor, timer	1
17	0501379	Switch, timer	4
18	0708769	Timer, cycle assembly	1
19	111277	Transformer, 24V	1
20	106364	Indicator light	1
21	900725	Kit, pushbutton (Includes items 22, 23)	1
22	111617	Contact block (NO)	1
23	111614	Switch, pushbutton	1
24	111980	Circuit breaker 5A (Beginning with S/N 13116 and above)	1
25	0508668	Decal, control cabinet	1

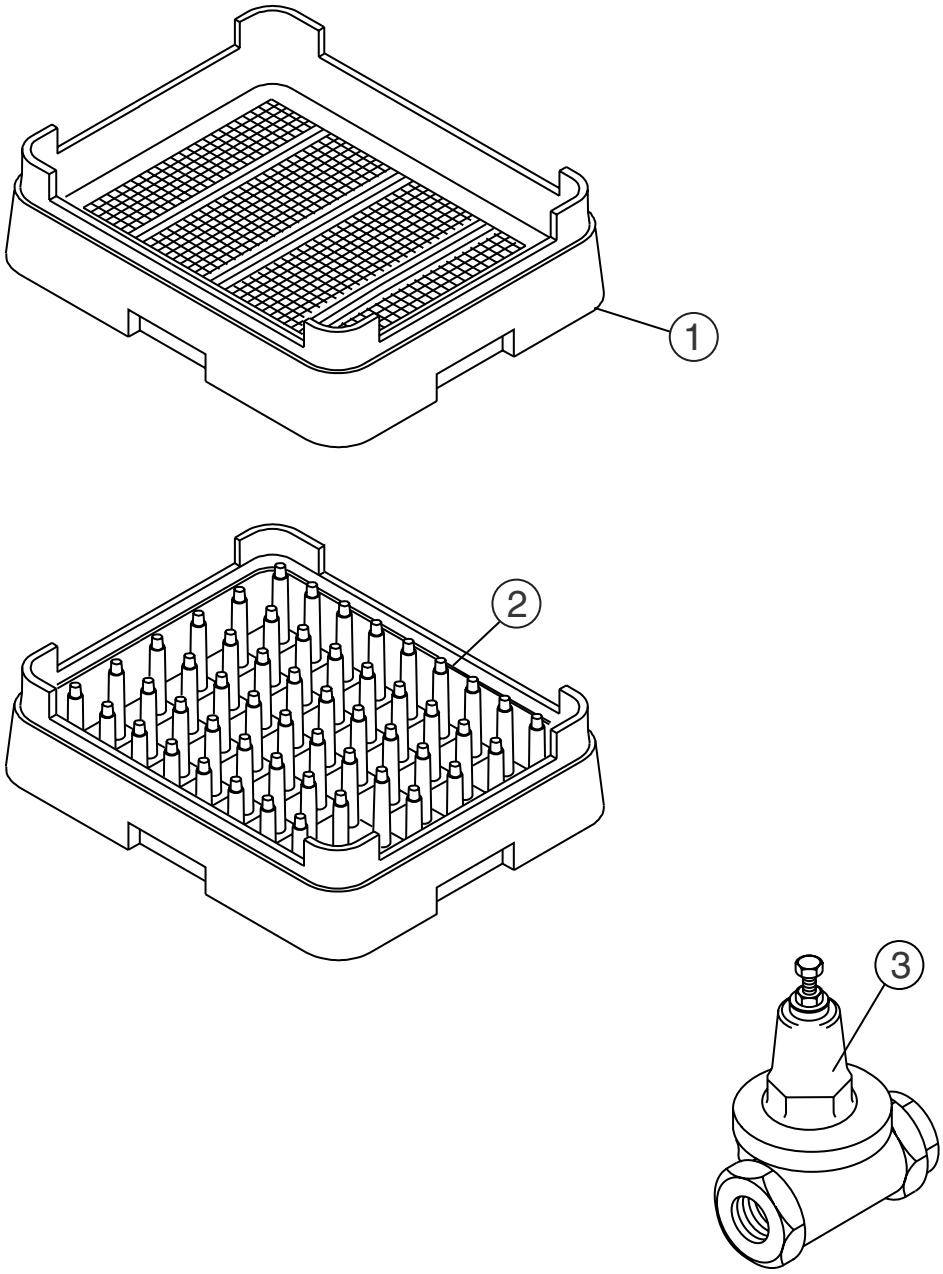
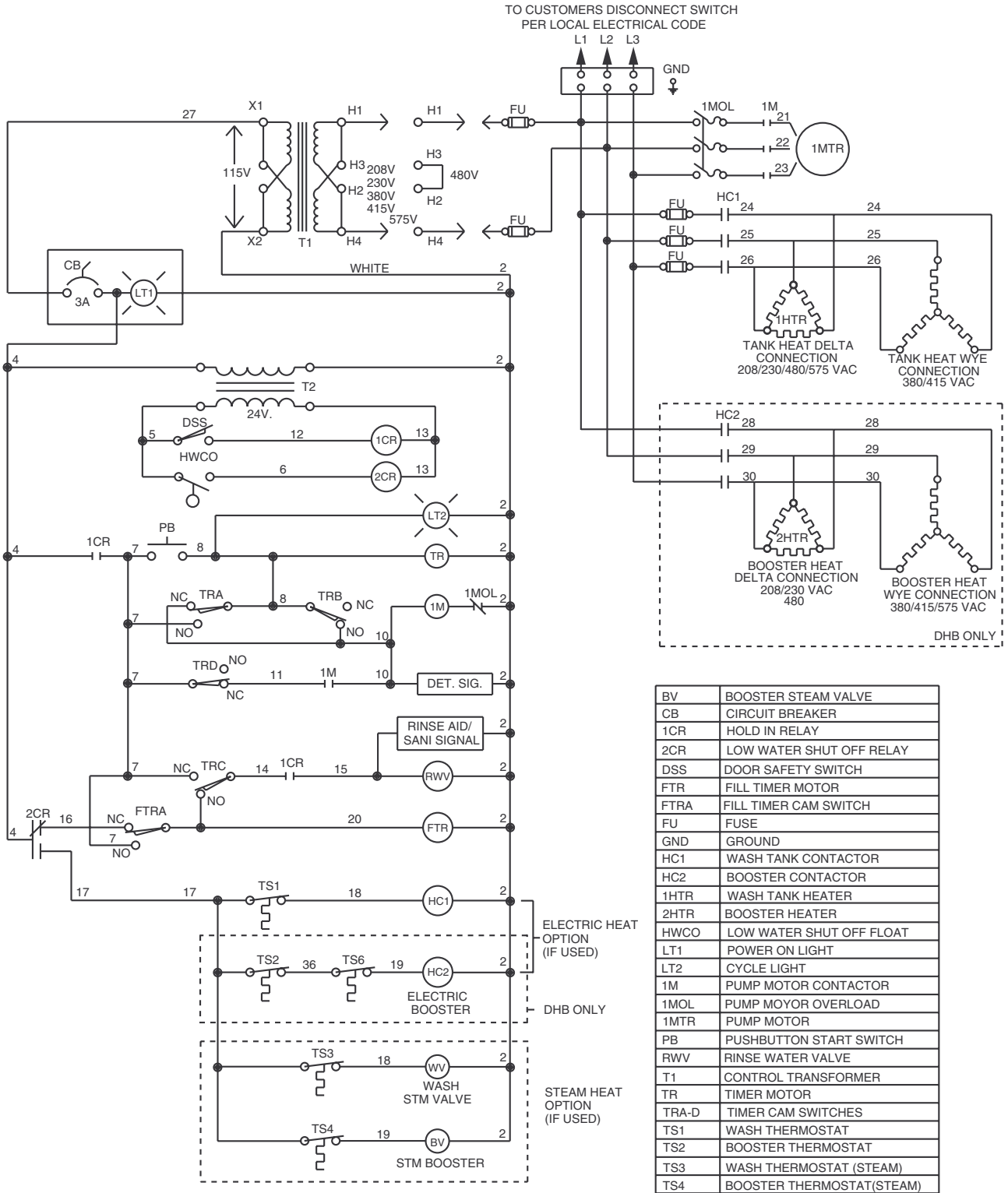


Figure 37 – D-HB/D-H1/D-LF
Dishracks and PRV

D-HB/D-H1/D-LF
DISHRACKS AND PRV

Fig. 37 Item No.	Part No.	Part Description	Qty.
1	101273	RACK (FLAT BOTTOM)	1
2	101285	RACK (PEG)	1
3	112387	PRESSURE REDUCING VALVE (3/4") (PRV)	A/R



BV	BOOSTER STEAM VALVE
CB	CIRCUIT BREAKER
1CR	HOLD IN RELAY
2CR	LOW WATER SHUT OFF RELAY
DSS	DOOR SAFETY SWITCH
FTR	FILL TIMER MOTOR
FTRA	FILL TIMER CAM SWITCH
FU	FUSE
GND	GROUND
HC1	WASH TANK CONTACTOR
HC2	BOOSTER CONTACTOR
1HTR	WASH TANK HEATER
2HTR	BOOSTER HEATER
HWCO	LOW WATER SHUT OFF FLOAT
LT1	POWER ON LIGHT
LT2	CYCLE LIGHT
1M	PUMP MOTOR CONTACTOR
1MOL	PUMP MOYOR OVERLOAD
1MTR	PUMP MOTOR
PB	PUSHBUTTON START SWITCH
RWV	RINSE WATER VALVE
T1	CONTROL TRANSFORMER
TR	TIMER MOTOR
TRA-D	TIMER CAM SWITCHES
TS1	WASH THERMOSTAT
TS2	BOOSTER THERMOSTAT
TS3	WASH THERMOSTAT (STEAM)
TS4	BOOSTER THERMOSTAT(STEAM)
TS6	BOOSTER SAFTEY THERMOSTAT
WV	WASH TANK STEAM VALVE

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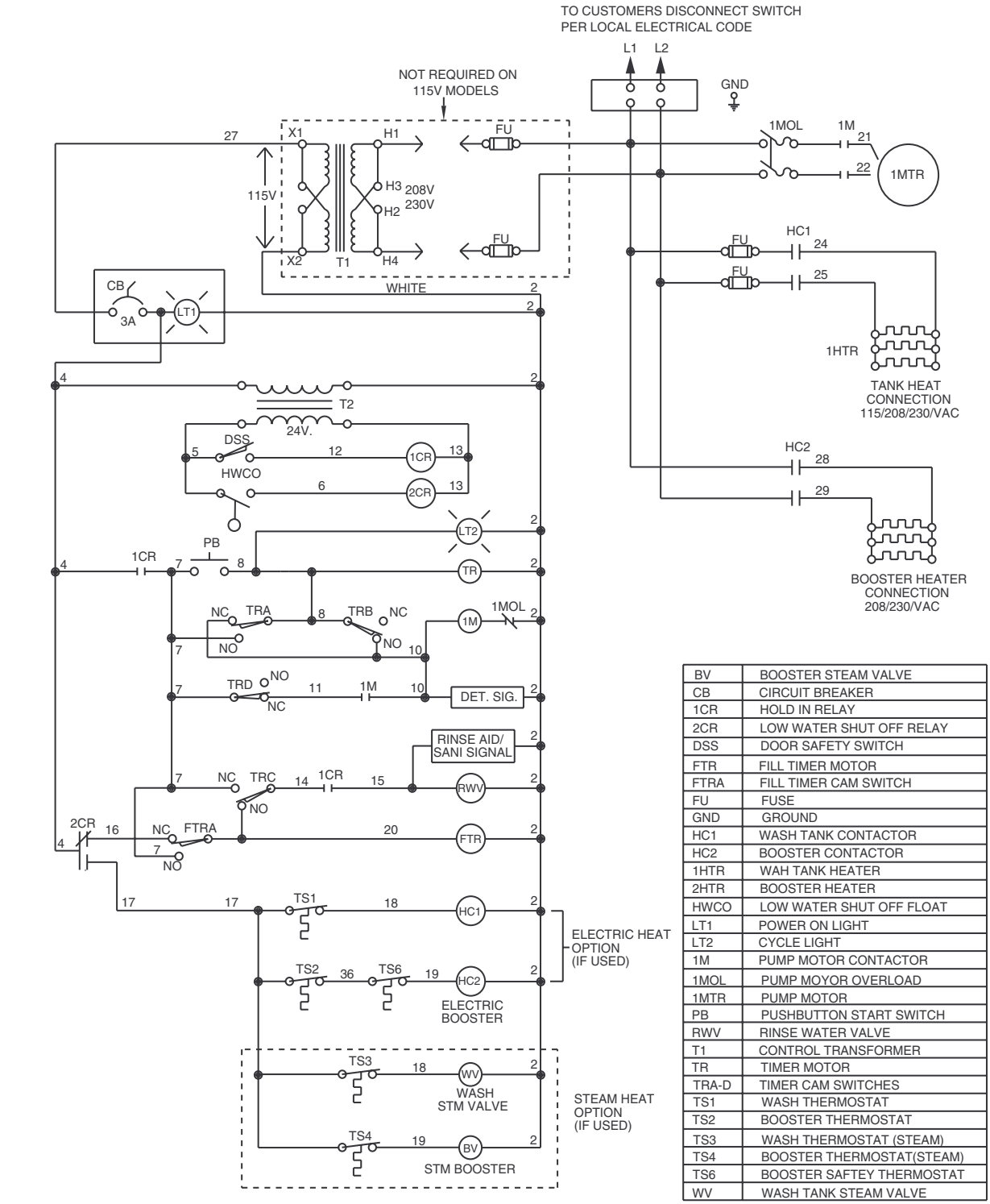
CAM	60 SEC TIMER (TR)
A	TIMER MOTOR
B	WASH / DWELL
C	RINSE
D	INSTANT START

CAM	90 SEC TIMER (FTR)
A	TIMER MOTOR & FILL

Figure 38 – Electrical Schematic DHB/D-H1 3 Phase



BV	BOOSTER STEAM VALVE
CB	CIRCUIT BREAKER
1CR	HOLD IN RELAY
2CR	LOW WATER SHUT OFF RELAY
DSS	DOOR SAFETY SWITCH
FTR	FILL TIMER MOTOR
FTRA	FILL TIMER CAM SWITCH
FU	FUSE
GND	GROUND
HC1	WASH TANK CONTACTOR
HC2	BOOSTER CONTACTOR
1HTR	WAH TANK HEATER
2HTR	BOOSTER HEATER
HWCO	LOW WATER SHUT OFF FLOAT
LT1	POWER ON LIGHT
LT2	CYCLE LIGHT
1M	PUMP MOTOR CONTACTOR
1MOL	PUMP MOYOR OVERLOAD
1MTR	PUMP MOTOR
PB	PUSHBUTTON START SWITCH
RWV	RINSE WATER VALVE
T1	CONTROL TRANSFORMER
TR	TIMER MOTOR
TRA-D	TIMER CAM SWITCHES
TS1	WASH THERMOSTAT
TS2	BOOSTER THERMOSTAT
TS3	WASH THERMOSTAT (STEAM)
TS4	BOOSTER THERMOSTAT(STEAM)
TS6	BOOSTER SAFTEY THERMOSTAT
WV	WASH TANK STEAM VALVE

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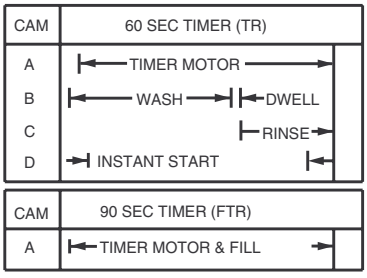

Figure 39 – Electrical Schematic D-HB/D-H1/D-LF 1 Phase